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Precision SHOOTING

a magazine for Shooters by Shooters

Precision SHOOTING

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COVER PHOTO

The 100 yard firing line of the Permian Basin Rifle and Pistol Club range between Midland and Odessa, Texas. Beyond the end of the 100 yard line may be seen the covered 200 yard line. At the photographers back is a 25 and 50 yard range. The 100 yard range has 21 firing points and the 200 yard range has presently 26 points. Shooting is toward the south.

The bench tops are poured concrete, re-inforced, 3 inches thick and set on 3 inch drill pipe legs.

Each range is separated from the adjacent one by an earth bunker, 11 feet tall at the rear. All three ranges may be safely operated at the same time without interference between each other.

The Gulf Coast Regional Championship Varmint and Sporter Class matches were fired on this range over the 4th of July weekend.

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RECREATION IS A SERVICE BUSINESS

Providing facilities for recreational activities is today a "Service" business which is steadily growing and expanding. To the best of our knowledge, private capital providing facilities for target shooting as a recreational activity has no more than made a bare start. It is this writer's opinion that there is a profit expectation potential for such businesses and that if they are properly exploited they can substantially increase the number of people engaging in purely recreational target shooting and thereby greatly improve the "climate" for the shooting sports.

I'll state now that I do not belittle the role of shooting clubs in keeping recreational and, especially, competitive target shooting alive. However, with some outstanding exceptions, their record for promotion of recreational shooting is not impressive. Shooting clubs do provide range facilities of some sort for the use of their members. The majority of shooting clubs, which depend on membership fees for their chief source of operating revenue, do not have resources to provide more the bare necessities of range facilities. Too, what is everybody's business is very liable to be nobody's business. Spasmodic efforts may be made to increase membership but too frequently they are not very successful. A history of the life of shooting clubs would, I believe, attest to the accuracy of these observations. Promotion of recreational target shooting needs greater effort than this.

The old phrase "money talks" is no less true today than it ever was. To provide adequate, comfortable, pleasant facilities for recreational target shooting of any type requires substantial sums of money. Potential profit from the investment of capital demands that there be an adequate potential market area (customers) for the location. That means a reasonable concentration of people and for outdoor range facilities that means a location reasonably near at least a suburban area and that in turn means relatively high land costs. Most desirable locations for commercial indoor (gallery) ranges for rifle and pistol shooting would appear to be in urban or suburban areas. For recreational rifle and pistol shooting the indoor (gallery) range may offer the greatest potential for both profit and promotion. (But indoor recreational shooting would have to compete with bowling, which already has a head start, and at least equally modern, comfortable, pleasant facilities would be required.)

Any commercial shooting facility would need to have a satisfactory volume of business to assure any profit. To presently attain that volume would require a very high order of intelligent, aggressive and persistent selling and promotional effort. While the number of people in the area might be satisfactory it is probable that only a small percentage of them would be already interested in shooting and probable customers. The much greater number would be "potential," for whom the desire to participate in recreational shooting would have to be cultivated. A commercial indoor shooting range would not be a "fast buck" proposition but in a favorable location I believe it might be a reasonably profitably business.

"Service" businesses complement and aid other businesses, both manufacturing and distribution. Successful commercially operated target shooting facilities which by successful promotion may have increased the total number of people participating in recreational target shooting would aid the entire shooting-goods trade, from manufacturer to local merchant.

Presently, Winchester-Western appears to be the first major shooting-goods manufacturer to show recognition of the potential worth of commercial target shooting facilities and with their Franchized Gun Club program are doing something to encourage the movement in the trap and skeet shooting field. They have made notable progress in getting Franchized Gun Clubs established and in operation throughout the nation. It will take more than a starting season to determine the worth of this franchized gun club plan but this writer anticipates that such a plan will prove successful and that the movement will grow.

The success and growth of the privately owned commercial shooting preserves are proof that "service businesses" in the shooting sports field can be successful.

One of the most recent of the Winchester Franchized Gun Clubs is being operated by an already established commercial shooting preserve. This would seem to be a rather natural and desirable combination of two related shooting sports. It is possible that recreational target shooting facilities might be successfully combined with other established recreational facilities.

A number of the heavily capitalized northern skiing resorts are expanding into year-around recreational resorts. At such resorts an indoor shooting range would add an evening activity during the skiing season, and outdoor ranges could add to summer activities. Since such resorts are usually located in normally rural surroundings, with building planned and restricted, shooting ranges could be included without valid objections from neighboring land-owners.

Admittedly the foregoing is little more than one person's day-dreaming but history shows that many of yesterday's day-dreams have become today's realities. I'll probably bore you with more of the day-dreaming but if you've come this far with me you've had enough for one time.

P. H. T.

COMING MATCHES

(We will list place, date, type and title of match, name of sponsoring organization, name and address of contact person, at a nominal flat rate of $2.00 per insertion, prepaid with insertion order. Insertion orders must reach the Precision SHOOTING office, Lyndonville, Vt., 05851, at least 45 days before date of match for single insertion orders. For multiple insertions, 30 days additional must be allowed for each additional insertion desired.)

MURRYSVILLE, PA: September 25 and 26; The Penna. State Free Rifle Championship (50 meters 3-position International course). Murrysville Rifle Club, c/o William R. Funk, 3336 Sardis Road, Murrysville, Pa.

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THE REDFIELD Front-IER SCOPE SIGHT

Having fairly recently had the opportunity to examine and try one of the REDFIELD Front-IER 2X 1" tube scope sights, which mount forward of the receiver on a rifle barrel, I have had to revise some but not all of my pre-conceived "opinions" about this type of sight and mounting.

With the sample scope, JR-IER mounts were supplied with bases for each the Rem. 600 and Win. 94 rifles. Not having either model rifle, and not wanting to get into any barrel drilling job for mounting the scope, I borrowed a Remington 600 carbine in .308 Win. cal. from a local dealer to mount and try the scope on. The base fastens to the top rib and receiver of the Rem. 600 in holes already provided.

I found the scope and mounting entirely practical for the intended purpose of fast accurate aiming of a short range woods hunting rifle. As advertised, one does see around the scope as well as through it in aiming (as one does when using a receiver sight with large thin rimmed aperture) and this does aid in "getting onto" and following a moving target in wooded cover. This feature

would probably also be an aid to a person without any previous scope sight using experience.

The 2X magnification provides a relatively wide field of view at rather close range. It extends the practical length of the hunting day by permitting accurate aiming in the dim early morning and late evening light when iron sights are useless. It permits more accurate aiming under all short range conditions for older people whose eyes "ain't so good as they used to be" (as mine now are).

The Front-IER scope and JR-IER mounts are REDFIELD quality throughout; not cheap in any sense—**but good.**

P. H. T.

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THE STRELA SMALLBORE RIFLE

William Funk, Murrysville, Pa. has for several years been concentrating on the International style small bore rifle shooting and for some two years has been shooting one of the STRELA (Russian made) rifles. He has written about the rifle as follows:

"The Strela rifle is one that I got from Roy Dunlap a couple of years ago. It is a ruggedly made piece of equipment and, for the most part, well finished. The action is quite heavy, the bolt has three locking lugs, in addition to the bolt handle. It has set triggers; the best that I have seen in my limited experience. The lock time is very fast. The stock has a quite noticeable cast-off. The butt plate is, of course, adjustable up-and-down and there are spacers supplied so the length can be adjusted to suit the individual. The grip is smaller and shorter than our versions of the thumbhole stock, but it does seem quite comfortable. There is a rail inletted into the fore-end for the sling swivel and palm-rest. The barrel is over 28" long and heavy. The sights are offset to the left. The front sight can be adjusted up and down to give the height of sight line desired. The barrel is very close to .224 and is somewhat rough when compared with Douglas and Eric Johnson barrels that I have. Looking at the muzzle at an angle through a hand lens under a strong light one can see reamer marks on the lands. Being a little rough, the barrel is inclined to load rather easily. It seems to prefer Mark III, which I have been using, lubricating the bullets with lanolin.

"All in all, it would seem that our Soviet friends know how to make a good rifle. This one came with a leather case, sling strap, palm rest, the sights and inserts, a wooden box with screw drivers, punches, brushes, and oil can, etc. When I get the gun, I cleaned it, tightened all the screws, adjusted the trigger to suit and started shooting. Since then the trigger hasn't changed or given any trouble. Aside from routine cleaning and care, no other work has been done on the rifle in 2 years time."

Bill was runner-up to Barry Trew in the annual Spring Free Rifle Match at the Murrysville Rifle Club's range in May.

TOURNAMENT CIRCUIT

MURRYSVILLE, PENNSYLVANIA

Thirty-one participated in the Franklin TWP Free Rifle Match at the Murrysville Rifle Club on July 3rd and 4th, including six from the Army Marksmanship Training Unit, Fort Benning, Ga.

Bill Funk reports that the Saturday shooters had a mostly overcast, rather windy day to contend with. Sunday it cleared up and the wind was less, but it was replaced by a heavy mirage that wandered back and forth. His guess was that the weather conditions averaged out.

The aggregate top ten all fired scores of over 1100 for the 50 meter ISU course, including five of the MTU shooters. Scores in order of ranking were: Dennis A. Dingman, MTU, 1143-12x; Donlad W. Adams, MTU, 1132-16. David Kimes, MTU, 1126-11; Jim Beger, MTU, 119-15; Dean Bahrman, civ., Arlington, Va. 1118-12; Mike Eddy, Brave, Pa. 1115-18; David Ross, MTU, 1111-8; Wm. R. Funk, Murrysville, 1107-12; T. Y. Wu, Ann Arbor, Mich., 1104-15; and R. Barry Trew, Bentleyville, Pa., 1101-22. The sixth MTU shooter, J. K. Frazer, was not listed with a kneeling score but his 391-8 prone and 356-2 standing ranked 5th in each position.

(Editor's comment: Two items from this match score bulletin particularly impressed me. First, it appears evident that our Armed Services Marksmanship Training Units are developing a "depth" of ISU course shooting skill that puts the U. S. in a rather favorable position in World shooting competitions. Second, the score of Barry Trew, a former MTU shooter, might indicate that constant competitive practice is rather essential for maintaining high scoring in the ISU shooting courses.)

NEW YORK STATE SMALLBORE CHAMPIONSHIP WON BY 16 YEAR OLD JUNIOR

Daniel B. Wood of Elbridge, New York, only 16 years old and in the master class, fired a total of 3182 points and 209x's to win the 1965 New York State Prone Championship Trophy sponsored by the Rochester Rifle Club at Canandaigua July 31st and August 1st.

With six years of experience at Camp Perry and other tournaments, this youngster outscored his father, the one time State and National champion, by one point and four X's. And to top it off, his 12 year old brother Burce, competing as a junior with iron sights all the way, scored a total of 3127 points to win 2nd place in the junior division of the State Match. There were many top flight scores from the New York State Shooters,

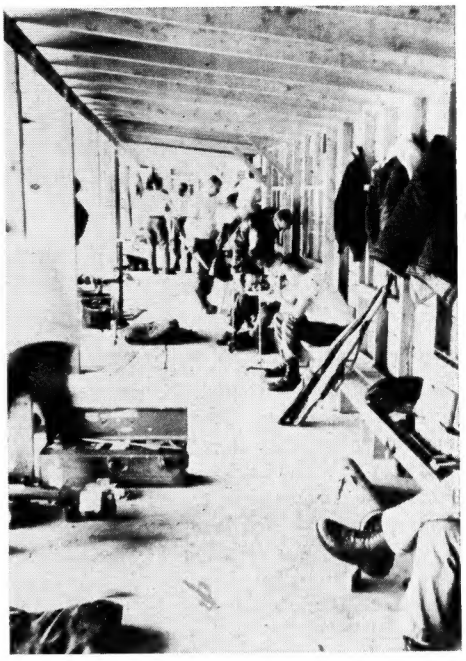
Champion	Daniel Wood	3182-209
Master class	Alonzo Wood	3181-205
Expert class	Richard Karas	3157-148
Sharpshooter	Clifford Noon	3125-149
Marksman	Nancy Noon	3061-109
Junior	Clifford Earl	3141-150

80 competitors attended this two day, dual purpose tournament; first, to select the New York State Smallbore Champion; and second, to determine an Open Champion in honor of the 50th anniversary of the Rochester Rifle Club. There were 50 entries from New York State. Others included nine form the USAF International Rifle Team. Lackland AFB Texas, and six from the USMC Smallbore Team, MCS Quantico, Virginia. Both service teams fired excellent scores, the Airforce beating the Marines by 6 points.

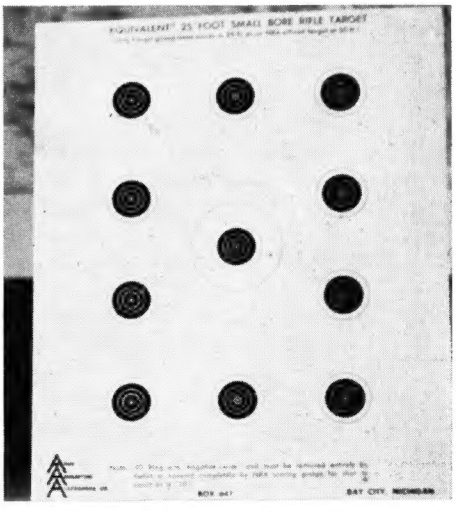
The Open Championship, a 2400 point aggregate, was won by Ray H. Green, USMC with 2393-154, one point over T/Sgt. Allen Hannon USAF. Larry Wilniks, Seville, Ohio, was next in line with 2391-183. George Stidworthy, Prescott, Arizona, fired 2390-165. And high lady, Mary Parris of Asheville, N. C. got a splendid 2382-150. Expert was Richard Karas of Buffalo; Sharpshooter, R. Dockendorrf of Liverpool; Marksman, Donald Dewey of West Chester, Pa.; and Junior, Sam Moore from Pittsburgh.

The tournament saw many possibles fired despite the tricky wind and some very tight scoring. The winners had to shoot every inch of the way, there was no leniency and luck was of little value. It was a man's match but a boy won it.

Olin G. LeRoy



The assembly line space behind the firing booths in the Murrysville Rifle Club's (Pennsylvania) ISU smallbore course (50 meter) shooting house. Each shooting booth accommodates two competitors.



A rifle target for the 25 feet range. It is stated that scores made on this target at 25 feet range are approximately the same as those made on the official A17 50 Ft. gallery rifle target. The targets are available from Arms Ammunition Accessories Co., Box 641, Bay City, Michigan.

Random Shots

By Betty Summerall Duncan

Moving on to **Wiesbaden,** in the wake of significant successes in Switzerland, the USA MTU team of riflemen met formidable Russian and West German squads on July 13-17.

Conditioned by the hard-fought U. S. Internationals and stimulated by the Swiss competition, the 6-man U. S. team poured on the power **Standing** to overcome Russian **Kneeling** strength . . . World Records were ignored as though they were nonexistent . . . West German sports writers reported that they had never seen such shooting . . . The Russians fired scores, team-wise, higher than they had ever fired before—but, we still won.

Only in the English Match did the results generally seem unimpressive, which gives us an insight into conditions. High individual honors went to Russia's **Parchimowitsch,** who "Creedmoored" Capt. **Tommy Pool's** 594. He scored one more 10—55 to 54—as Pool shot an 8 . . . Following with 592 were Chujan (USSR), Gunnarsson, Krilling, and Wenk (West Germany), in that order.

Note how evenly matched the teams were with only a 9-point spread in the total English, or Olympic, Match scores—:

1. **USA**	
Krilling	592
Anderson	587
Pool	594
Wigger	587
	2360
2. **USSR**	
Parchimowitsch	594
Lapkin	587
Chujan	592
Nijasow	580
	2353
3. **West Germany**	
Kohnke	589
Pilch	586
Wenk	592
Zahringer	584
	2351

Utilizing the English Match as a good warm-up, all three teams surpassed West Germany's 1574 World Record in the prone stage of the 3-positional smallbore. Speaking of close competition, this was it. The USA and USSR teams were tied up at 1582! West Germany barely trailed with 1578 . . . After their outstanding 1547 Kneeling victory—over the USA's 1537 and West Germany's 1526—the Russusian seemed confident of having the match won.

Their premature estimate possibly overlooked the enthusiasm with which **Gary Anderson & Company** execute the Standing position. We placed all 6 of our men, including alternates, among the top 8. The Russians were said to be aghast at U. S. offhand scores—they couldn't believe such scores. Their high of 369 was our lowest. To break down the Standing results—:

1. **USA**	
Krilling	371
Anderson	376
Pool	370
Wigger	373
	1490
2. **USSR**	
Parchimowitsch	362
Lapkin	360
Chujan	369
Jarosch	364
(54 x 10)	1455
3. **West Germany**	
Klingner	371
Kahnke	360
Marx	360
Zahringer	364
(48 x 10)	1455

Hollywood has worn out all of the descriptive adjectives in the English language, leaving us inadequately equipped to comment on the above performance. The French would applaud with "C'est magnifique!" . . . Yes, it is truly a magnificent achievement -- exceeding USA's own World Standing Record by 24 points. But—STOP! Consider how infinitesimal is the 10-ring on the 50-meter ISU target. Let's think about it so that we may fully appreciate what it entails to average in the 370's **Offhand** . . . I submit that few shooters in this country can improve upon that **prone!!!** (If you care to debate the point, first note that some of the Dewar Team scores dip into the 370's. No reflection on ability; it merely emphasizes the unfamiliarity with the target, which we discussed last month.)

As **Gary Anderson** reaffirmed his right to the World Standing crown with a repeat of his 376 record (fired at Cairo), he and his teammates, with their aerial offensive, skyrocketed to a 4609 aggregate—outdistancing the USSR World mark by 40 points.

50-meters — 3-positions

(Standing scores listed above)

	P	K	
1. **USA**			
Krilling	397	381	1149
Anderson	390	387	1153
Pool	397	389	1156
Wigger	398	380	1151
			4609
2. **USSR**			
Parchimowitsch	396	388	1146
Lapkin	396	387	1143
Chujan	397	387	1153
Jarosch	393	385	1142
			4584
3. **West Germany**			
Klingner	396	382	1149
Kohnke	390	383	1133
Marx	398	379	1137
Zahringer	394	382	1140
			4559

The star of this show was TOMMY POOL, Olympic veteran and U. S. International Smallbore Position champ. Heading the U. S. delegation, his 1156 led the field by 3 points over Chujan, who "Creedmoored" Gunnarsson and Anderson on the basis of the better prone. Krilling's 1149 outranked Klingner's, which placed 5 of our men among the top 6.

At the site of the 1966 World Championships, these three major powers were keyed up to a precision peak. Skies were overcast, accented by a continuous light rain, while wind was definitely not a factor. Such ideal conditions paved the way to the most fantastic **300-meter** scores of all-time!

U. S. shooters were "underdogs" going into the Standing, but again (as in smallbore), **Standing told the story.**

In the **prone,** Pilch, Itkis, Parchimowitsch, and Wigger (98 last stage) leveled off at 397—the Record held by Poignant of Sweden and Spillmann of Switzerland. Team rankings were: (1) USSR—1582, (2) USA—1574, (3) West Germany—1561.

Kneeling, it was Jarosch—394, Foster—391, Nijasow—391, Anderson—391 (96 last stage), and Itkis—389, the top official mark. Pool was just under it with 388 . . . Team placement was tighter than in the prone—: (1) USSR—1553, (2) USA—1550, (3) West Germany—1521.

Capt. **John Foster** shot a beautiful 94. 95, 94, 95 for a 378 Standing victory, a point over Gary Anderson's record! Runner-up was Anderson with 374, followed by Parchimowitsch—371, Wigger—370, Itkis—369, Nijasow—367, and Gunnarsson—366. Totals were: (1) USA—1488, (2) USSR—1464, (3) West Germany—1419.

Aggregate 300-meters

	P	K	S		
1. **USA**					
Gunnarsson	392	383	366	1141	
Foster	391	391	378	1160	4612
Wigger	397	385	370	1152	
Anderson	394	391	374	1159	
2. **USSR**					
Parchimowitsch	397	386	371	1154	
Itkis	397	389	369	1155	4599
Jarosch	396	394	364	1154	
Lustberg	392	384	360	1136	
3. **West Germany**					
Wenk	387	378	352	1117	
Marx	389	381	355	1125	4511
Harbeck	388	382	355	1125	
Pilch	397	380	357	1134	

Vital Statistics—Six scores exceeded the 1153 World Record established by Anderson in winning the gold medal at the 1964 Olympics. . . . JOHN FOSTER covered himself with glory as his **1160** lied Anderson by a point!!! . . . 13 points separated the U. S. and Russia as we blasted our World Record (What a shame that it wasn't official) by **55 points!**

***

Now for the **hard luck award** . . . . Bill Krilling, alternate on the 300-meter team, was scheduled to shoot the day before the team match with no opportunity to practice. When his rifle blew his third round up in the chamber, he was hurting, because he had to go for record as soon as the malfunction was remedied. That could

badly dent one's confidence. With the rifle appearing to walk up and down, so did Bill's performance—for him, extremely sub-normal. A fine thing to happen to the National 300-meter Champion!

****

In overall tabulations, the USSR led with 23 points over 21 points for USA teams and 10 points for West Germany, as Russian shooters claimed all three pistol events and the Running Deer competition.

Burchett's 550 was second to Wolitschenko, who won the **Free Pistol** (50-meters) with 559. Results are as follows:

1. **USSR**	
Poddubnyj	546
Solejmanow	542
Stolypin	548
Wolitschenko	559
	2195
2. **USA**	
Burchett	550
Mosely	538
Wessel	540
Cochran	532
	2160
3. **West Germany**	
Lippert	531
Lang	537
Deppe	542
Meyer	528
	2138

At 25-meters **Centre Fire,** SFC Aubrey E. Smith fired 586 to place 4th, instead of 3rd, via the tie-breaking rule. Bakalow led with 592.

(Note: If Schnellfeuer is translated other than Centre Fire, merely reverse the following results with Gebrauchs-Pistole, which I assume to be Rapid Fire. The absence of a German dictionary is a handicap at the moment. If I guessed wrong, have a laugh on me.)

Olymp. Schnellfeuer-Pistole

1. **USSR**	
Bakalow	592
Sulejmanow	586
Wolitschenko	581
Franzewsky	591
	2350
2. **Deutschland**	
Moller	583
Schreyer	582
Masurat	582
Muller	583
	2330
3. **USA**	
Burchett	568
Mosely	580
Smith	586
Ogden	577
	2311

Gebrauchs-Pistole (Rapid Fire)

1.	USSR	1149	1170	2319
2.	USA	1143	1168	2311
3.	BRD	1147	1155	2302

***

Five of the world's greats fired the Running Deer, including Foster, who posted 145 as an alternate. Russia placed three shooters—Staratelew—164, Nikitin —159, Kondakow—155 — followed by Moeller, Crow, and Wentworth.

1. **USSR**	
Staratelew	164
Nikitin	159
Kondakow	155
Lustberg	148
	626
2. **USA**	
Moeller	151
Crow	150
Wentworth	149
Kingetter	148
	598
3. **West Germany**	
von Langen	132
Huber	131
Lencer	127
Witting	124
	514

COMPETITIVELY SPEAKING

Twin Falls, Idaho

Returning to the firing line, **Mike Allen** put together a pair of 400-32's and 400-33's to come up with that previously mentioned 1600-130X to win the **Any Sight Aggregate.** Firing a Douglas-52C with Kenyon trigger and Mark III (Iron sights: Bell front and Int'l rear), Mike used a second-hand Unertl scope which he hasn't had time to focus yet. Perhaps he was better off not seeing too clearly, but this is not recommended procedure.

Ray Wheeler, shooting an Anschutz (reportedly), wasn't far behind with 1599-123X, as Bill Grater's 1598-134X came in third . . . JoAnn Sanborn Creedmoored Grater to win the **Dewar** with 400-33X . . . At **100-yds.,** it was Allen—400-32X, Wheeler—400-27X . . . Bill Schlitzkus, from Springfield, Ore., took the **meter,** 400-36X over Montanan George Cooper's 400-34X. Schlitzkus repeated with a **50-yd.** win—400-35X to Grater's 400-34X.

Wheeler and Grater comprised the successful team in the any sight Dewar. Their score? 799-63X.

***

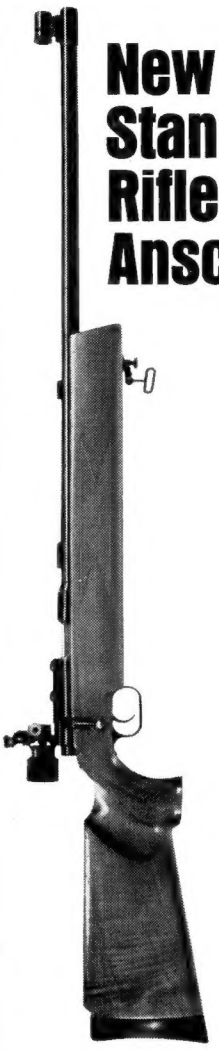
For Wheeler and Allen, the Idaho State Matches on July 5th were an anti-climax, or so it seemed from their aggregate scores. Having won their share, they apparently relaxed and shot for fun.

Calif. State Champ **William J. Grater** added the **Idaho State Championship** to his collection. Winning the three difficult matches with 400's, Bill spoiled a potential 1600 with a 9 at 50-yds. any. (What did you say, Bill?)

Sharing honors with Grater is **JoAnn Sanborn,** who unseated Henry Benson as **Resident Champion** with a very fine 1597-102X. That was all right with Henry as he taught her to shoot and his graduation gift to her was a complete outfit, including one of his famous 37's. . . . Jo Ann, who reports for active duty in September as a second lieutenant in the women Marines, **won an expense-paid trip to** Perry on the basis of her 3-day aggregate . . . To

(Continued on Page Sixteen)

New I.S.U. Standard Rifle from Anschutz



How can a rifle designed especially for international matches be just what U. S. smallbore shooters are looking for? Easy. The Anschutz people built a position rifle to meet the new International Shooting Union "Standard" classification. What they came up with happens to be ideal in weight and stock design for U. S. match requirements.

It's built on the same Match 54 action that was used by 7 out of 10 of the smallbore shooters in the Tokyo Olympics (and all the medal winners).

The 1408 weighs about 10 pounds, easily meets the I.S.U. limit of 5 kilograms with sights. The single stage trigger, adjustable for weight of pull, creep and backlash, is set for 500 grams (1.1 lbs.). A replacement spring is included to convert to a 3 pound pull for U. S. matches.

The ⅞" diameter, 27½" barrel is precision rifled and hand-lapped for peak accuracy. The French walnut stock has adjustable butt plate, raised cheek-piece, contoured pistol-grip and a deep fore-end for position shooting. Full length swivel rail and scope blocks. **$145.** (Sights extra.) Left-hand stock, **$157.**

Prices subject to change. For free full-color catalog, write: Savage Arms, Westfield 68, Mass. 01085. (A Division of Emhart Corporation, Savage, Anschutz and the Indian head Reg. U. S. Pat. Off.)

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Hungary sets new world record in prone 50 meters small-bore

This and many other international wins are the results of advanced research and years of testing. New materials, new production methods and a completely new factory have been combined to bring the shooter the finest, most consistent and accurate .22 target ammo in the world, ELEY!

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RIFLE TWIST, VELOCITY, AND ACCURACY

By Fred W. Hallberg

Shooting today has become more and more a hobby in its own right. Today we do not all go to the range with the avowed purpose of practicing to kill something. Many of us go there because it is an interesting diversion and a sport that can be enjoyed by young and old. We might go there just to prove out some particular phase of a game that has its roots in the fields of mechanics, chemistry, physics, optics, and mathematics. We might go there just because it is fun to do so and, even if most of us have no desire to become experts at the game, that is no reason why we should not pursue it to the limit of our available time.

During the past several months I have been trying to come up with a simply stated and demonstrated rule that combines the three ballistic factors of twist, velocity, and accuracy. Unfortunately, the stock of the rifle I was using for test "went out" and so I now put forth my ideas as theory only.

There is a need to present this relationship in a manner that is meaningful to the ordinary shooter. There is no lack of such information in the literature of physics and higher mathematics, but to find it you have to have the energy of an athlete and the nose of a bloodhound. Messrs. Yard and Powley have done some some excellent work in that direction but they have not yet reached this last brick in their structure. In 1935, Wallace Cox and Edgar Beugless, then ballistic engineers at Du Pont's Burnside Laboratories, published a set of charts that enabled almost anyone without extensive mathematical experience to determine most of the factors concerning a bullet's flight. As is apparent by my own well-thumbed copy, and despite some minor errors in it, I have found this 19 X 12 inch eleven page booklet a most useful source of information. But they did not touch on the relationship of twist, velocity, and accuracy.

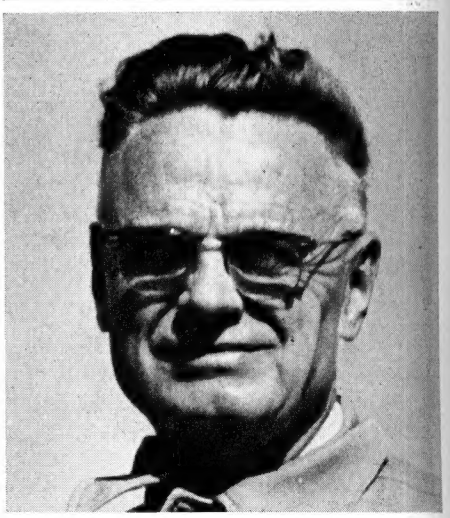
Now then, if us ordinary souls develop a yen to design and build a rifle for, say, 1000 yard target shooting, where should we begin? Experience may have taught us what our stock design should look like, what the total weight of the rifle should be, and what our personal choice of sighting equipment should be. But how should we determine the caliber and cartridge? Even if we did know what cartridge we wanted, how should we determine the best twist for our particular purpose?

Before raising further questions we must assume certain things. Good bullets are an absolute necessity. Without them, accuracy is impossible. Bullet shapes available today are generally satisfactory. But they must also have proper weight, symmetry, and be properly assembled. Uniform primers, propellents, and cases, must be properly and uniformly assembled into the finished cartridges. Therefore, in order to build up a useful and readily applied relationship of twist, velocity, and accuracy, we must assume our components and cartridges are perfect. Then we can proceed to build up our relationship in its pure form without contamination from outside influences.

Several months ago I put together a rifle which, I had hoped, would illustrate the affect of twist on accuracy. Tre caliber was 6.5 X .30/06. Barrel used was an extra Schultz-Larsen barrel drilled and rifled for the 6.5 X 55 Swedish international match cartridge. I point this out because 6.5 X 55 military barrels are different. This means that my match barrel was designed for a 139 grain boattailed, sharp-pointed bullet traveling within a velocity range of 2200 to 2500 foot-seconds at the muzzle. Personal experience and the experience of friends indicate that the best all around results are obtained at the lower mid-point of this bracket. Twist in such a barrel is 8¼ inches.

If we increase cartridge capacity to that of a .30/06, it must be assumed we are trying for increased velocity. I believe this maximum velocity with the above mentioned 139 grain bullet approaches 2900 F/S. But when fired at this velocity through this 8¼ inch twist barrel, the best 10-shot group that can be obtained at 200 yards will approximate 3 inches. From that point there is only one direction we can go as far as velocity is concerned and that is down. But as velocity is gradually reduced, groups also become smaller and it is my belief that if I could have gone down all the way to the 2200-2500 velocity bracket I would finally have achieved the same 2 inch or smaller groups that are produced with our regular 6/5 X 55 target rifles. Unfortunately, final tests will have to be postponed until sometime later this year because in the middle of my tests the rifle stock went sour, due, I believe, to a prolonged period of unusually wet weather. It will be some time before I can get around to fixing it. Nevertheless, groups did improve as the velocity approached that for which the barrel was originally designed. Velocity greater than that creates what some shooters refer to as over-stabilization. What they really mean is that the bullet is spinning at a greater velocity than is necessary to stabilize it. Most of us take it for granted that over-stabilization produces inaccuracy. It is my personal opinion that too great a twist also increases chamber pressures. When these tests are finally completed, I intend to replace this barrel with another of the same size and weight and chambered for the same 6.5 X .30/06 cartridge but cut with a 10 or possibly 12 inch twist. The choice will depend on some further research. Then I expect I shall be able to drive that 139 grain bullet at higher velocities than .30/06 capacity can produce and get the same accuracy that the bullet now is capable of at the lower velocities in the 8¼ inch twist barrel.

Despite the importance of this relationship of twist to velocity and accuracy in any caliber, note how seldom it is mentioned in any literature pertaining to a particularly accurate load or rifle. If anyone takes any degree of time to write such an article (and all shooting magazines present beautifully written articles on the subject of accuracy that must have taken considerable time to write) I still



Fred W. Hallberg

consider it useless information unless twist is also mentioned. A friend who knew I was thinking about this subject drew my attention to an article in the August issue of Guns and Ammo Magazine which spoke of the intended use of large capacity cartridges of 6.5 caliber in the 1965 Wimbledon 1000 yard match but nowhere did they mention anything about twist. Perhaps they are waiting to publish that information after the event.

Some well known examples of this relationship of twist and velocity to accuracy are available. One is the venerable .30/06 Springfield rifle. In order to stabilize anything the military might decide to run through this rifle it was necessary to use a fast 10 inch twist. Such a twist will produce practical accuracy for the whole range of bullets from the long light-density tracer and the 220 grain bullet to the 150 grain ball bullet. Even the 125 grain bullet worked well at the shorter ranges. But at top velocities this twist does not produce maximum accuracy. Run a 150 grain bullet at 3000 F/S out of a 10 inch twist barrel and your accuracy will be somewhat less than if the same bullet is run at 2500 F/S. Put that same bullet through a 14 inch twist barrel at the same 3000 F/S velocity and see the improvement. I say this despite the fact that I have seen some phenomenally small groups made by Federal Cartridge T W military 150 grain ammunition at 600 yards. In that particular case unusually superior bullet quality offset excessive twist. When maximum 300 meter accuracy was desired for international match use from the heavy match type Springfield 10 inch twist barrel, it was necessary to drop muzzle velocity for the 172 grain bullet to around 2200 F/S. At the time this was done, it was said that the real purpose was to take advantage of reduced recoil because full loads were unnecessary at this short range but the fact remains that reduced velocity also made group size shrink.

To more readily appreciate this question of twist and its relationship to accuracy, we should give it a name so that the shooter can visualize it as a factor in the movement and control of his bullet. In past articles appearing in this journal I have referred to it as RPM (revolutions per minute). That may be clumsy because it always necessitates multiplying the first result (revolutions per second) by 60 seconds in order to get the RPM. In other words, if a bullet travels through a 12 inch twist barrel at 3000 F. S., it will turn 3000 times per second. Multiply 3000 by 60 seconds and you get an RPM of 180,000. A 10 inch or faster twist at this same 3000 F/S velocity will increase the RPM and a 14 inch or slower twist will decrease the RPM. A 24 inch twist will cut the RPM in half. Some such figure is necessary because if you are getting accurate results with a particular bullet at a particular velocity in a 10 inch twist rifle and you want to produce that same accuracy at a higher velocity you can use the RPM to calculate the corresponding reduction in twist.

Perhaps graphs should be created for each caliber which will indicate the proper twist for each commonly used bullet weight at various velocities. That would make a book of 15 to 20 graphs. But someone more energetic than I should tackle this job. I doubt I have either the patience or ability to do it. Until such graphs do appear, I shall continue to play the tune by ear.

• • •

THERE'S ALWAYS A WAY

By William E. Peterson

There was I, stuck with over fifteen hundred lead .45 pistol bullets which were unaccountably undersize. How it happened I just don't know—maybe the mold shrank, or something. Or maybe the pistol barrel had become worn so that some of the bullets just fell through it, without benefit of rifling. Anyway that's what some of the scores looked like. So I pushed a couple of the bullets through the barrel, and you could see where the rifling didn't always take hold.

Saddened by the prospect of remolding fifteen hundred bullets that at least looked perfectly good, I went over to cry on the shoulder of my gunsmith friend Joe Rivers, of Rowayton, Connecticut. Joe is the guy who makes those hand-carved pistol grips that fit like they were molded to your hand, and give you the impression that you just can't fail to make a good score. (You can, of course, only it is not as easy to do it as with standard grips.) Well anyway, Joe sympathized with me, checked with a mike some of my bullets against some of his, and mine were undersize all right, no two ways about it. "How many of these things did you make?" he asked. I told him, enough to keep me shooting a couple of months. "Too bad," he said, "nothing for it except to melt them all down and remold them in a proper size mold. Unless—hey, wait a minute. Come back in the shop."

So he went to his big vise, put one of the bullets in it, and squeezed the bullet endwise, that is from nose to base. Took the bullet out, miked it, and by then it had gained three thousandths in diameter. "You've got a vise like this," said Joe, "set it with a stop so the handle will rotate to the same point every time, giving each bullet the same squeeze, and I think you will find that those bullets will perform all right. You may have to put them through the sizing die again, but it's a lot better than doing the whole job all over."

So I hastened home and went to work, increasing the diameter of fifteen hundred bullets by the simple procedure of squeezing them endwise, all to the same compression point.

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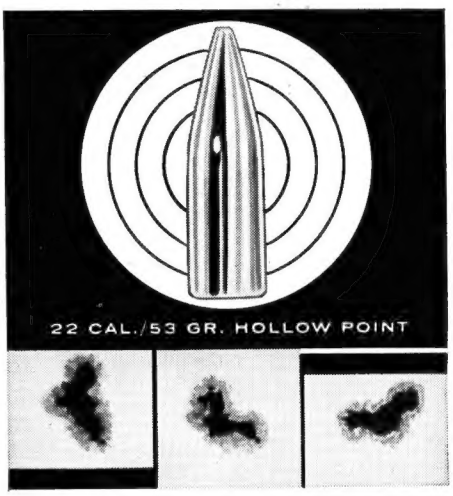

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1965 BENCH REST MATCHES

(CLASS ABBREVIATIONS: Bench Rest Rifle—BRR (Unrestricted rests Un. Restricted rests Re.). Heavy Varmint—HV. Light Varmint—LV. Sporter class—Sp.)

EASTERN REGION

Augusta, Ohio: September 18 and 19, Eastern Region Bench Rest Rifle (Un) Championship. Reed's Run Rifle Range, P. O. Box 66, Augusta, Ohio.

Fassets, Pa.: October 2 and 3. All matches for HV, LV and Sp classes. South Creek Rod & Gun Club, c/o Gerald Arnold, R. D. #2, Gillett, Pa.

Johnstown, New York: September 3, 4 and 5 (National Championships, HV, LV and Sp classes). Pine Tree Rifle Club, Inc., c/o Edward J. Sweeney, 501 North Market St., Johnstown, N. Y.

Canton, Ohio: September 25 (all matches for Heavy Varmint class **only**, and all matches start at 2:00 P. M. and continue under lights in evening). Canton-McKinley Rifle Club, c/o R. H. Johnson, 3118—11th St. S. W., Canton, Ohio.

MID-CONTINENT REGION

Tulsa, Oklahoma: September 19 (day)—all matches for BRR—Un and HV. Tulsa Bench Rest Rifle Club, c/o R. G. Berry, Pawnee, Oklahoma.

Wichita, Kansas: October 2—4:30 PM (BRR—Un and HV). Wichita Bench Rest Rifle Club, c/o Henry W. Barton, 1841 S. Chautauqua, Wichita, Kansas 67211.

Kansas City, Kansas: September 25—4:00 PM (HV class); October 16—4:00 PM (BRR—Un). Mill Creek Rifle Club, Inc., c/o L. F. Carden, 5022 Waverly, Kansas City 4, Kansas.

MISSISSIPPI VALLEY REGION

St. Louis, Missouri: Miss. Valley Regional Championships, October 2 (LV and BRR—Un and Re—8 AM and 1 PM) and October 3 (HV and Sp—9 AM and 1 PM).

NON-REGISTERED SHOOTS: September 12 (Hunting rifle); September 26 (Varmint hunters). Bench Rest Rifle Club of St. Louis, Larry Kuenz, Sec'y, 2912 Lincoln St., St. Louis, Mo. 63121.

NORTH CENTRAL REGION

Iowa Falls, Iowa: September 11 (HV—night) and September 12 (Sp—9 AM). Iowa Falls Gun Club, Lee R. Boddy, Sec'y, Iowa Falls, Iowa.

NBRSA EASTERN REGION MEMBERS MEETING

A meeting for NBRSA Eastern Region members will be held at the Pine Tree Rifle Club, Johnstown, New York, Saturday, September 4, 1965 at 8:00 P. M.

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Orchard Park, New York
Area Code 716, TX4-4433

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NBRSA MEMBERSHIP DUES:

Individual annual dues $6.00 (includes magazine subscription for membership term). Associate member (wife or husband, son or daughter under 18 years of age, of member in good standing—no magazine) $2.50. Life membership $75.00. Annual club affiliation fee $10.00.

NEW BENCH REST RECORDS

Certificates have recently been issued by the NBRSA for the following official new bench rest shooting records:

To Robert W. Hart, Nescopeck, Pa. for five new records, all shot at a Chippewa Rifle Club match on the Easton, Ohio range May 9 and 10, 1964.

A 5-shot group at 300 meters range measuring .6377 inch. This beats Sam Clark's long standing record of .6735 inch.

An aggregate of five 5-shot matches at 300 meters measuring .4202 minute-of-angle (MOA).

An aggregate of five 10-shot matches at 300 meters range which is measured as .6840 MOA.

An aggregate of five 5-shot matches at 200 yards and five 5-shot matches at 300 meters measuring .4430 MOA.

An aggregate of five 10-shot matches at 200 yards and five 10-shot matches at 300 meters measuring .6114 MOA.

The equipment used by Mr. Hart in making these new records was: A Hart action with Hart barrel chambered for the 308 Win. cartridge, 29" long, 1.350" diameter, 1 in 14" twist, weight 26 lbs. He did all gunsmithing and stocking work himself. He used a 24X Unertl scope. His load was 48 grs. H380 powder with Sierra 168 gr. match bullets and CCI magnum primers.

Mr. Hart's records are all for Bench Rest Rifle—restricted rests class.

. . . . . .

Certificates have been issued to Mr. Edward A. Suchan, Oakland, Calif. for Heavy Varmint class aggregate records fired at Richmond, Calif. in an evening match June 26, 1965.

An aggregate of five 5-shot matches at 200 yards measuring .2584 MOA.

An aggregate of five 5-shot matches at 100 yards and five 5-shot matches at 200 yards measuring .2491 MOA.

Mr. Suchan's eguipment was a Shilen action with Hart barrel chambered for the 222 cartridge, 26" long, 1.250" to .900" diameter, weighing 13 lbs. 5 oz. He did his own gunsmithing and stocking. Scope was a 20X Unertl. His load was 22.5 grs. Ball-C powder, his own 51.5 gr. bullets made in B&A dies and Remington 6½ primer.

. . . . . .

Certificates have been issued to Lawrence S. Rucker, Akron, Ohio for the following records made in Bench Rest Rifle—unrestricted rests class, all shot in the Chippewa Rifle Club's range at Easton. Ohio, May 29 and 30, 1965.

An aggregate of five 5-shot matches at 300 meters measuring .4161 MOA.

An aggregate of five 5-shot matches at 200 yards and five 5-shot matches at 300 meters measuring .4302 MOA.

An aggregate of five 10-shot matches at 200 yards and five 10-shot matches at 300 meters measuring .6012 MOA.

Mr. Rucker's equipment was a Weber action with Hart barrel chambered for the 308 cartridge, 28 inches long. Gunsmithing was by Dempsey Frost and Rucker did his own stock work. His scope was a Lyman 30X. His load was 48 grs. H380 powder, Sierra 168 gr. match bullets and CCI magnum primers.

. . . . . .

A certificate was issued to Dempsey E. Frost, Akron, Ohio, for a Bench Rest

(Continued on Page Twelve)

BENCH REST SHOOTING FROM SAND BAG RESTS

By Ed Shilen

Sand bags are to bench rest shooting as the manual gearshift is to the modern automobile. Other systems have been developed but many shooters still insist on using sand bags just as many drivers prefer the manual shift. A lively discussion on the relative merits of sandbags versus other methods of maintaining a rifle in position for bench rest competition can be started in almost any evening bull session after a match. The arguments on both sides were well presented in Al Angerman's article on precision rests.

One point should be made clear, however. Under the present rules of the National Bench Rest Shooters Ass'n, only sand bags are permitted for front and rear rests in the Sporter, Light and Heavy Varmint Class competition. It is only in the unrestricted rests Bench Rest Rifle Class that sand bags are not required. Obviously then, the fundamentals of shooting from sand bags are important to all bench rest shooters except those who shoot in the unrestricted rests class; and many of these riflemen cut their teeth in bench rest competition on good old fashioned sand bags.

Learning to shoot correctly from sand bags also is important to the non-bench rest rifleman. Shooters have found that sighting in hunting rifles, big bore or small bore competition rifles as well as testing loads or testing new ideas in the eternal search for full accuracy potential requires a means of eliminating or reducing as much as possible the human element involved in holding a rifle. One way of doing this is to shoot from a bench or table and sand bags are eminently satisfactory and readily available for supporting the rifle upon the table.

Specific rules regulating the use of sand bags in NBRSA competition are detailed in the organization's rule book. Shooters are urged to secure a copy by writing to NBRSA Secretary-Treasurer Bernice E. McMullen, 607 West Line St., Minerva, Ohio 44657. The price is 50 cents.

It should be emphasized that this article will not teach the art of guessing wind and mirage. That has been covered in an excellent discussion by Dr. Sam Nadler. Our purpose here is to teach the new shooter the proper holding and controlling of the rifle to obtain its full accuracy potential when shooting under a condition of no wind and mirage. Once the shooter has mastered control of his rifle so that he knows the "out" shots are not due to a faulty shooting technique—Sam Nadler dubs this "shoulder mirage"—he can go on to the long and sometimes agonizing labor of outguessing conditions. Lest this discourage the new shooter it should be emphasized that the published winning groups are not every day occurrances—even national champions are occasionally caught with oversized groups in something less than a hurricane.

Surprisingly, most new shooters and even many experienced shooters try to learn how to dope conditions before they have learned a proper shooting technique. Under this condition almost everything is blamed for the "out" shot except the "shoulder mirage" contributed by the shooter. Shoot under ideal conditions until your let-off is perfect. Then, assuming your gun is accurate you know the shot out of the group is your own fault. Acquiring a perfect let-off removes one of the greatest obstacles to learning how to dope conditions. This point is emphasized because a minor error in let-off which probably could not be identified in other forms of shooting might spell disaster for an otherwise winning bench rest group.

The inexperienced shooter, having acquired a rifle which the gunsmith has assured him will "put them all in one hole," usually falls into one of two classifications. One school believes there "is nothing to it"; that nothing could be easier than shooting a rifle which is lying perfectly still on a pair of sand bags. The others believe they are lousy shots and, even off sand bags, could not shoot a "one holer." The truth lies between these extremes. I have known a few people who took to shooting off sand bags as a duck takes to water but not everyone is that lucky. Shooting off the bags can be fairly easy and can be mastered in a short time **IF** the shooter is shown the correct method of holding and controlling the rifle until the bullet leaves the barrel. It can be very difficult if the shooter holds the rifle in such a way as to cause the rifle to "throw shots."

A discussion of what happens when the rifle is fired will explain why correct and uniform control of the rifle and trigger is extremely important. The old myth that the bullet leaves the barrel before the gun moves has long been exploded. Without going into an unnecessarily detailed explanation it is sufficient to say that the rear movement of the gun is affected by the inertia of the gun, friction between the gun and the sand bags and any contact between the gun and the shooter. Because, when the gun is properly held, all of these restraints are below the center line of the bore, the result is a flip of the muzzle BEFORE THE BULLET LEAVES THE BARREL. Because the barrel, no matter how heavy, is not completely rigid, the shock of the explosion causes it to vibrate, with relation to the original bore centerline, in the manner of a tuning fork. A third factor is that the barrel is given a twisting motion about its axis in a direction opposite to the twist of the rifling. These movements cause the barrel, at the moment the bullet emerges from the muzzle, to be some distance removed from its position immediately before firing. Because a difference of only one-thousandth of an inch in the relative positions of the muzzle and breech before and after firing is a deviation of more than one-tenth of an inch at 100 yards, it is remarkable that we are able to achieve present standards of accuracy. This emphasizes the need to use every possible precaution to obtain uniform recoil.

(Editor's note: NBRSA co-editor M. H. "Mike" Walker comments that the movement of the rifle while the bullet is passing through the barrel is probably not important with center-fire rifles having a muzzle velocity above the speed of sound.)

Because the literature on the subject is adequate we will not describe the construction of a shooting bench other than to point out that its height and contours should permit the shooter to be completely relaxed before and during the let-off. Nothing is so destructive to small groups as tight, tense muscles which tend to ease up as the trigger is pulled. Of course, excepting on your own range, you cannot be sure of drawing a bench which will fit you exactly or even approximately and you can expect benches on any range (there are some outstanding exceptions) to vary. If you are very serious about winning, some precautions are advisable. Many shooters provide cushions to adjust steel height. Several carry adjustable piano stools. One shooter has a cheap camp stool whose legs can be cut if necessary. Such is the attention to detail necessary to produce winning targets.

What is the proper shooting technique? Ask 50 shooters and you will get 50 answers. In my own shooting and in the instruction of many shooters who come to our range I have found the system I advocate most successful. I must admit, however, that some of the competitors I try to beat do well with different methods. I can only suggest that you give my system a fair try and, if you find another which works better, use it.

Broken down, holding falls in four basic classifications:—(1) The hard hold. (2) The medium hold. (3) The light hold. (4) The free holid.

THE HARD HOLD: This hold is illustrated in figure 1. The trigger hand grips the stock very tightly, shooter's cheek is pressed tightly against the comb and the shoulder is pressed tighlty against the butt of the rifle. Sometimes the shooter will use a sling (exactly as he would in the prone position) or hold the fore-end of the rifle to keep it from jumping. I have

even seen some shooters place their left hand on top of the barrel to prevent jump. The hard hold is the very worst for bench rest competition. It has its place in the testing of very powerful rifles but is guaranteed to place the average shooter well down in the winning list in a match. I know a few shooters of exceptional ability who get good results with this type of hold, but it is definitely not recommended for beginners. With this system it is very difficult to hold exactly the same for every shot.

THE MEDIUM HOLD: The trigger hand holds the stock firmly but not tightly, the shoulder is firmly against the butt stock but not exerting any pressure against it and the shooter's cheek is placed against the stock comfortably but without undue pressure. This hold is most often used with big game hunting rifles whose recoil is great. Here again the grouping ability of the rifle will depend on the shooter's ability to hold the rifle with the same pressure for each shot. This method is recommended only for rifles having heavy recoil.

THE LIGHT HOLD: Illustration #2 shows the trigger hand gripping the stock very lightly with the thumb beside, rather than over, the grip. The shoulder barely touches the butt with absolutely no pressure against it. The cheek just barely touches the comb. Probably more shooters use this hold than any other. Extreme care must be taken not to tighten the grip or change pressure on the butt stock or comb. You must concentrate on your hold for every shot.

THE FREE HOLD: Illustration #3 shows the hold I consider the very best, especially when used with the heavy bench rest rifles where recoil (including .30 caliber) is mild. I also find it best for the varmint and sporter classes in .22 and 6mm caliber. When using the free hold you DO NOT touch the rifle at any place other than the trigger. The trigger hand is held beside the stock in position to reach the trigger, the butt stock is one-half to one inch away from the shoulder and you look through the scope without touching the comb with your face. This hold is best because, with the exception of slight differences in positioning of the gun on the rests, the gun will recoil almost exactly the same for every shot. With this hold the only thing you have to concentrate on is trigger let-off. Although it is the simplest method of holding a rifle, for many it is the most difficult to learn and master. It just does not seem natural to shoot a gun without touching it and there is always a strong tendency to hold the gun.

Whatever method you use, concentrate on using exactly the same grip, shoulder and cheek pressure for every shot and FOLLOW THROUGH. Most people understand the follow through of a golf club or tennis racket, but what is follow through when you touch off a rifle? Remember, the rifle is recoiling while the bullet is still in the barrel and you must maintain your hold until the bullet leaves the muzzle. In other words, do not tighten or loosen your hold as the gun discharges. Concentrate on maintaining the

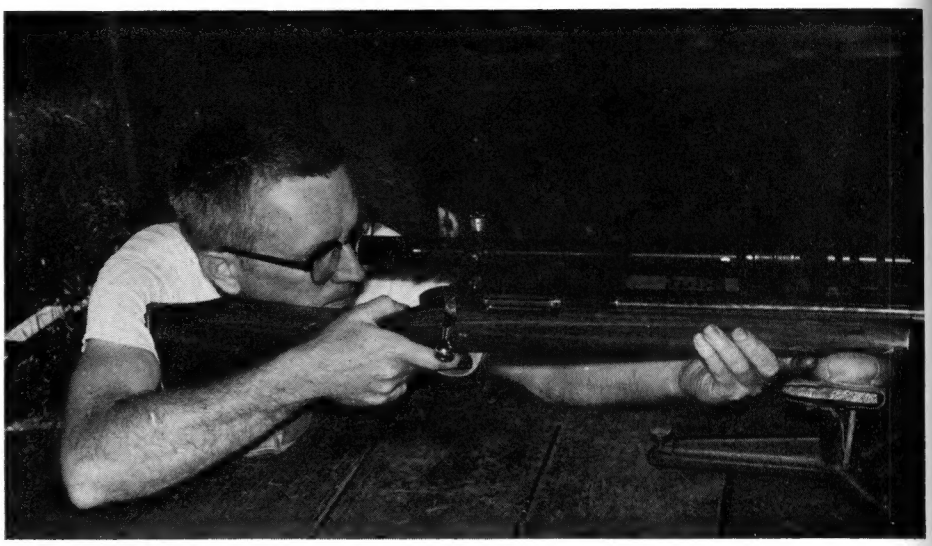

Fig. 1 The hard hold. The trigger hand grips the stock tightly, cheek is pressed tightly against the comb and the shoulder pressed tightly against the butt. The poorest hold for benchrest competition.

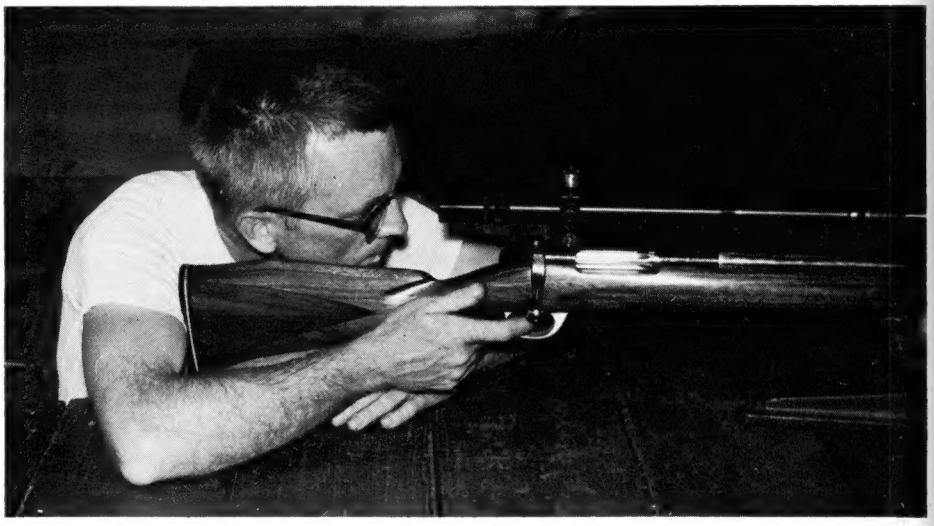

Fig. 2 In the light hold the trigger hand grips the stock lightly with the thumb beside the grip. Shoulder just touches butt with no pressure and cheek barely touches the comb.

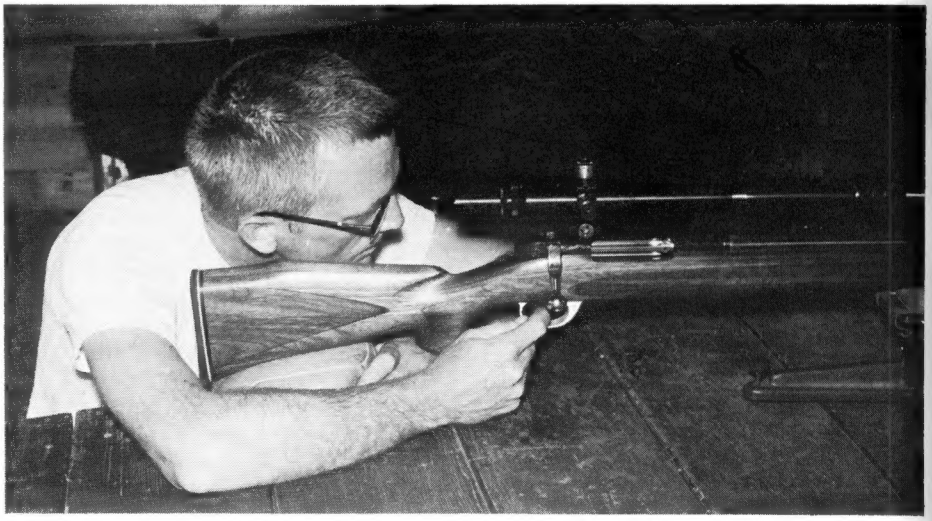

Fig. 3 The free hold which I consider the very best. Other than the trigger finger no part of the body touches the gun. Note the generous space between shoulder and buttstock. Left hand is shown squeezing the rear bag for elevation control.

same hold before, during and after discharge. It is a natural reflex to tighten up as the gun fires. Watch it!

At this point it is well to go back to our earlier reference to the need to take a relaxed position at the bench, because this position is the easiest to maintain through the firing sequence. Place the rests on the bench and adjust the gun on the target in a position which feels comfortable. Close the eyes and relax or "sag" so that no muscular effort or tension is required to hold the body in the assumed position. If this position is not appropriate to the control of the gun, repeat the process. Then a good follow through will insure a good shot. The reverse situation usually occurs with a good target and just one more shot to go. Muscles tighten to screaming knots and the mind becomes jittery with hope and prayers for a good one. A let-off under this condition almost guarantees a few choice cuss words. If the tight position is maintained the resistance to recoil will differ from the previous shots. If, as is more likely, the body relaxes at the instance of recoil, the results are even more disastrous. The remedy is to take a few deep breaths, a new mental approach and start over.

A common cause of fliers is "bumping" the butt stock with the shoulder. "Bumping" is the act of pushing the shoulder against the butt stock as the rifle fires. It is a natural reaction for the shooter to try to stop the recoil with his shoulder, particularly if he is a stock crawler and has had the scope cut his nose. The cure is to move the head back or the scope ahead as far as possible while maintaining the full field of view in the scope. If necessary the eye can be moved further back so that the full field of view is not seen. This will not affect sighting accuracy; in fact, if some parallax is present, accuracy will be improved because the eye will more easily center the crosshairs or dot in the field. This method does have the disadvantage of so reducing the field that it becomes difficult or impossible to see mirage at the moment of let-off. If the problem is serious, it may be necessary to obtain a lower power occular or a scope with greater eye relief. Another cause of "bumping" is pushing the rifle ahead with the shoulder to see where the shot hit on the target. We are always anxious to see where the shot hit and soon we are pushing ahead before the bullet leaves the barrel. A good habit is to open the bolt first and extract the case before pushing the gun ahead to spot the shot.

The fact that the rifle is resting solidly on the sand bags does not permit careless trigger habits. Correct trigger control is as important in bench rest shooting as in any other kind but with one important difference—the trigger is pulled rather than squeezed. In most types of shooting you are taught to increase the squeeze of the trigger finger and entire hand. When shooting from the bench do not increase your grip and do not squeeze the trigger . . . pull it. How you pull it is also important. Be careful that the direction of pull is straight back with the line of recoil. Any up, down or side pressure can throw a shot. Remember, you are still pulling on the trigger as the bullet moves down the barrel. Pressure in any direction other than in the line of recoil can throw a shot. A light trigger pull is not only an advantage but a necessity when shooting from the bench. A trigger light enough to be "touched-off" instead of pulled almost eliminates the possibility of a shot being yanked out of the group. The "almost" is included because even a light trigger must be treated with respect. Yanking or slapping can result in inaccuracy. Insert the finger through the guard and move the finger backward in line with the recoil to touch it off.

Commercially-made sand bags are available in a variety of shapes and sizes. My recommendation is that the simple bags are best. The front pedestal needs only a sausage-type bag as shown in illustration #4. This bag should be about one inch in diameter and somewhat longer than the width of the rifle fore-end with which it will be used. The bag is placed crosswise in the pedestal saddle giving the fore-end a narrow bearing surface to ride on. The narrow bearing surface is desirable because wide surfaces give two possible sources of trouble. The wide surface creates more friction, making the repositioning of the rifle more difficult. Also, it can cause a less uniform recoil. A large front bag can cause the rifle to have a slightly different point of impact when moving between the sighter and record targets. The reason is that as the rifle butt is elevated or depressed to move from one target to the other, the point of bearing between the bottom of the fore-end and sand bag will change. This can cause a change in the point of impact.

The rear bag should be about 6" by 3". The exact size should be that which fits the hand comfortably. The left hand (of a right handed shooter) holds this bag to position the rifle on the target. If the big is too large, holding can be awkward. Both bags should be firmly packed with fine sand. Soft, mushy bags will not hold their shape and require a major readjustment for each shot. Pack the bags just firm enough so that you can "bang" the stock down on them a couple times and the bags will take a groove matching the stock contours.

The bag under the fore-end does little more than hold up the front end of the rifle. About the only thing you need to watch here is that the rifle is pushed back to the same spot after each shot. An easy way to do this is to put a piece of tape on the side of the fore-end directly over the spot where the fore-end rests on the bag. You can then visually check to see that the rifle is returned to its correct spot.

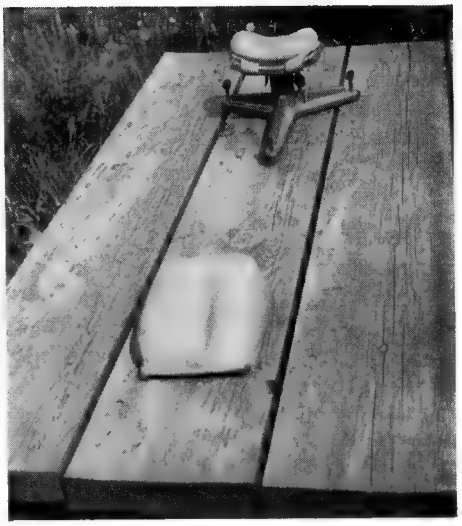

Fig 4 Show the sausage front bag and the rear bag grooved to fit the buttstock.

The use and manipulation of the bag under the butt is a little more complicated. There are many variations of the use of the rear bag but there are actually just two basic methods. There are "bag squeezers" and "non-bag squeezers." Both slide the bag sideways to get lateral placement. To get vertical placement, however, the "squeezer" uses a fairly soft bag which he squeezes to raise the butt and releases to lower the butt. The "non-squeezer" gets elevation adjustment by sliding the bag backward and forward under the butt stock. Because the bottom line of the butt stocks of Varmint and Sporter and some Benchrest rifles are slanted, sliding the bag back and forth controls elevation.

Bag squeezing is an art requiring time and practice to master. The exact amount of squeeze must be maintained through the recoil cycle. Increasing or decreasing the squeeze at let-off will result in an "out" shot. Good concentration and co-ordination is required to become a good bag squeezer. Again, follow through is important. Bag squeezing's big advantage is that it is the fastest way to align the gun on the target. This method is not recommended for the beginner. He will find the non-squeeze method slower but more reliable.

Most sand bags are made of leather because of its ability to take abuse. Friction between the leather bag and rifle fore-end is greatly reduced by sprinkling talcum powder on the bags. This enables the gun to slide easily and gives a more consistent recoil.

One problem, not the sole property of the sandbagger, faces all benchresters. Because a given condition rarely continues for an entire match, the shooter must be able to hold off from the center of his group by a distance which his judgment

and a possible check on the sighter target shows necessary. To facilitate accurate judgment of distances, NBRSA targets provide an aiming square with measurements related to the size of the scoring rings. The square, because of its large black area, also provides an aiming point when mirage runs so heavily that it is impossible to see the rings. Choices of an aiming point vary almost as widely as the number of shooters on the line. Because bench rest performance is evaluated by group size rather than score (excepting informal matches), the choice of aiming point and group position offers many possibilities. The new benchrester often chooses the poorest combination, the center of the center ring, as both the aiming point and group center. As the center ring is shot away it becomes almost impossible to refrain from drifting to the group center as the aiming point. Some shooters use either the center or an edge of the center ring as the aiming point and place the group some distance away. This is better but presents difficulties when heavy mirage is running. I believe most experienced shooters use the aiming square because of the advantages outlined above. Some sight on the center of the square and others choose a side or a corner. The choice is largely one of individual preference. With this aiming point, a wind requiring a wider hold than the area of the square permits can be judged by the position of the vertical cross hair in relation to the scoring rings. Under this condition mirage is unlikely. Using the sighting square, the choice of group center is not too important if the group is formed well within the scoring rings to permit their use for doping. I must admit, however, that a nice group cutting the center out of the X ring carries more prestige on the wailing wall and is somewhat easier to dope.

Caution dictates that the group should be kept a reasonable distance from the black square. It is discouraging to find that a group which looked good through the scope has an unseen flier in the black. Of greater concern, that unseen shot may have contained important doping information.

On reviewing this article, the beginning benchrester may well be appalled at the number of things he must do, keep in mind and concentrate upon. Be assured that a little practice will result in doing them naturally and without conscious effort in the same way as we do many things in everyday life. I am sure that a detailed description of how to drive an automobile would be equally complex.

In writing this article I have naturally stressed the things I have found to work best for me and in the instruction of others at our range. It is recognized, however, that because of differences in physique, coordination, temperament and sensitivity to recoil, some shooters will prefer one of the other techniques and perhaps add innovations of their own. I conclude with the hope that the information contained here will help the beginner to avoid many frustrating hours in the development of a shooting technique of his own.

. . . . . .

In bench rest shooting circles Ed Shilen is personally known by many as a worthy tournament competitor, and nationally by reputation for the custom made rifle actions and complete rifles he has made.

He was born in Pittsburgh, Pa. on January 27, 1931, where he attended school and graduated from high school. He is married and has two children. His wife, Emily, is also a very capable bench rest tournament competitor and quite frequently beats Ed in a match or aggregate.

Ed moved to Dryden, New York, in 1950 and soon got interested in woodchuck shooting and varmint rifles. This interest turned into amateur gunsmithing as a hobby. He continued as an amateur gunsmith untli 1961 when he turned to gunsmithing on a professional full-time basis.

In 1963 he merged his business with Shooters Service & Dewey Inc. at Clinton Corners, New York. He is now an officer in the corporation and in charge of the custom gun shop and barrel making shop. In addition to the gun shop and retail store, SS&D Inc. has operated a sizable and well appointed public shooting range where Ed has added to his experience of instructing and coaching beginners at bench rest shooting.

Prior to starting gunsmithing as a hobby, Ed had had no metal or woodworking experience. He is largely self-taught but he credits much of his success in gunsmithing to the guidance and assistance of his friend and neighbor in Dryden, Ross Sherman, who he considers the best gunsmith and machinist that he is acquainted with.

Shooting-wise, Ed has won State, Regional and National championships in each of the NBRSA Varmint and Sporter classes and has held a total of nine (9) national records in those three classes.

P. H. T.

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New Bench Rest Records

(Continued from Page Eight)

Rifle—unrestricted rests class aggregate fired at the Chippewa Rifle Club range, Easton, Ohio, May 29-30, 1965.

An aggregate of five 10-shot matches at 300 meters range measuring .5948 MOA.

Mr. Dempsey's equipment was a Mauser action with Hart barrel 28" long and 1.375" diameter chambered for a 30 Jet cartridge. He did his own gunsmithing and stock work. His load was 47 grs. H380 powder, Sierra 168 gr. Match bullets and RWS primers.

Bench Rest Match Reports

GULF COAST REGION CHAMPIONSHIP

The Permian Basin Rifle & Pistol Club of Midland and Odessa inaugurated organized competitive bench rest shooting at a match on May 4th and 5th, 1950. Their range had 10 bench **covered** firing line and shooting was at 100 and 200 yard ranges. The Texas Bench Rest Shooters Ass'n was organized at Midland in 1951. Then, apparently, tournament bench rest shooting at the Permian Basin Club range was discontinued until revived in 1965.

On July 2, 3 and 4, 1965, on its newly constructed modern range, the Permian Basin Club hosted the Gulf Coast Region Varmint and Sporter class Championships with 25 competing in Sporter class on the 2nd, 31 with the Light Varmint rifle on the 3rd and 29 with Heavy Varmint on the 4th.

Before the start of the Sporter championship matches on Friday, the 3 shots at 100 yards Cold Barrel Sporter Rifle match for the DAVEY CROCKETT Trophy was fired. This match was inaugurated and the trophy provided by Mr. John I. Moore at the National Shoot in Abilene, Texas, last year. Dr. Sam Nadler, New Orleans, won the match with a .197" 3-shot group. R. J. Maberry, Midland, was 2nd with .280", Ralph Saylor, Alamogordo, N. Mex. 3rd with .367", and R. C. Hanson, Midland, 4th with .377".

The shooters with the high aggregate rankings were:

SPORTER RIFLE

100 Yards

Jake Roberts, Abilene, Tex.	.6050
James B. Carpenter, San Antonio	.6938
Mike Carpenter, San Antonio	.7030
Ralph Saylor	.7048

200 Yards

Sam Nadler	.8494
Ralph Saylor	.8555
R. C. Hanson	.8629

Grand Aggregate

Ralph Saylor	.7801
Sam Nadler	.8064
R. C. Hanson	.8126
R. C. Thompson, Midland	.8373
James H. Carpenter	.8415

LIGHT VARMINT RIFLE

100 Yards

Sam Nadler	.5358
Jake Roberts	.6040
H. W. Ward, Snyder, Tex.	.6270
Grant Pickard, Grand Prairie, Tex.	.6492

200 Yards

Mike Carpenter	.6877
J. D. Richardson, Abilene, Tex.	.7068
R. C. Hanson	.7942
Grant Pickard	.8029

Grand Aggregate

Mike Carpenter	.6844
J. D. Richardson	.7152
Grant Pickard	.7261
Sam Nadler	.7575
H. W. Ward	.7704

HEAVY VARMINT RIFLE

100 Yards

R. C. Hanson	.4082
Sam Nadler	.4276
Jimmy Cook, Jacksboro, Tex.	.4428
J. D. Richardson	.4578

200 Yards

J. D. Richardson	.5393
J. L. Bonner, Cross Plains, Tex.	.6030
R. D. Link, Odessa, Tex.	.6045
Sam Nadler	.7126

Grand Aggregate

J. D. Richardson	.4895
J. L. Bonner	.5325
Sam Nadler	.5701
Jimmy Cook	.5782
R. D. Link	.6495

3-DAY, 3-GUN, GRAND AGGREGATE

Sam Nadler	.7113
R. C. Hanson	.7782
J. D. Richardson	.7811
J. L. Bonner	.8139
J. H. Carpenter	.8142
H. W. Ward	.8271

Sam Nadler shot a .308, Shilen action, SS&D barrel in Sporter class; a .222 Shilen-SS&D Light Varmint and a .222 with Shilen action and Hart barrel in Heavy Varmint class. R. C. Hanson shot Rem. 40-X rifles in all classes; a 6MM Int. Sporter, a 222 Light Varmint and .222 Mag. Heavy Varmint. J. D. Richardson shot a 6mm with Rem. action and Douglas barrel in the Sporter class, a .222 Sako action, Douglas barrel Light Varmint and a .222 Rem. action Douglas barrel for Heavy Varmint.

THE SPEER 4th OF JULY MATCHES

Participation in the Third Annual Speer 4th of July Bench Rest Matches made it an outstanding shooting event. Combined with the Kansas State Championships at the Mill Creek Rifle Club, Kansas City, it will undoubtedly be one of the great tournaments of the year. As a brief recap, 56 shooters shot a total of 106 rifles in the four classes. The matches started at 11:00 A. M. July 3rd and concluded at 4:00 A. M. July 4th. The second day's shooting started at 9:00 A. M. on July 4 and was completed at 2:00 A. M. July 5th, a total of 34 hours. Obviously a great deal of stamina was displayed by all and particularly on the part of the Mill Creek Crew who carried out the "hard" work in such Herculean fashion.

From some of the fine scores recorded it is apparent that weather conditions were most favorable. The range and facilities were in marvelous condition which certainly contributed to the enjoyment of all who participated.

We thank Dan Cotterman and GUN WORLD magazine for covering the matches and fine publicity for bench rest shooting as a competitive sport.

We were very happy to see such good friends of the shooting sports as Bruce and J. B. Hodgdon and their wives of B. J. Hodgdon, Inc.; Fred Huntington and Don Werner of R. C. B. S., Inc.; Mr. and Mrs. Ted Curtis of ALCAN; and Joe Aubert of Topeka representing the Kansas State Outdoors Writers Association.

This was the first time that the Speer Matches were held away from Lewiston, Idaho and I'm sure all will agree it was a tremendous success. It is the intention of the company to sponsor the tournament at a different range each year hereafter. The only request we make is that the range selected have adequate facilities and that their shooting fees be kept as low as possible in order that all who wish to may participate. The company furnishes the trophies and mementos of the match. All proceeds go to the host club to aid them in their range improvements and help defray the costs of any youth shooting activities they may undertake. We invite all interested clubs to get in touch with us for full particulars. (The address is SPEER Incorporated, P. O. Box 244, Lewiston, Idaho.)

Ray Speer

The top ranking aggregate statistics were:

SPORTER CLASS (16 competitors)

100 yards

Manley Oakley, Seattle, Wash.	.3254
Tom Gillman, Hot Springs, Ark.	.3436
Don Hill, St. Louis, Mo.	.5460
Small group, Tom Gillman .246"	

200 yards

Tom Gillman	.4848
Don Hill	.5600
Red Cornelison, Seminole, Okla.	.6205
Small group, D. Broderick .312"	

Grand aggregate

Tom Gillman	.4142
Manley Oakley	.4736
Don Hill	.5530

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HEAVY VARMINT (43 competitors)

100 yards

Larry Engelbrecht, Wichita, Kan.	.2380
Larry Beard, Tulsa, Okla	.2666
Don Hill	.2750
Small group, Engelbrecht .168"	

200 yards

Don Hill	.2948
Stephen Savner, Bethel, Kans.	.3473
J. Christopher, Overland Pk., Kans.	.3817
Small group, R. L. Shanafelt .330"	

Grand aggregate

Don Hill	.2849
Larry Engelbrecht	.3134
Stephen Savner	.3413
R. L. Shanafelt, Bonner Spgs, Kan.	.3485

BENCH RIFLE, restricted (20 comp.)

100 yards

Walt Berger, Overland Park, Kans.	.2636
Larry Engelbrecht	.2640
Wm. Schellert, St. Louis, Mo.	.3002
Small group, Walt Berger .193"	

200 yards

Don Hill	.3178
"Bud" Carden, Kansas City, Kans.	.3561
Walt Berger	.3722
Small group, Bud Carden .418"	

Grand aggregate

Walt Berger	.3179
Don Hill	.3236
Larry Engelbrecht	.3313

BENCH RIFLE, un-restricted (20 comp.)

100 yards

Walt Berger	.2358
Red Cornelison	.2606
Bud Carden	.2786
Small group, D. Whittington .202"	

200 yards

Bob Stultz, Kansas City, Mo.	.3200
Bud Carden	.3381
Red Cornelison	.3465
Small group, Bob Stultz .485"	

Grand aggregate

Red Cornelison	.3055
Bud Carden	.3083
Bob Stultz	.3240

A special Speer Match was held prior to the start of the registered 100 yard matches. Using Speer Silver Match 52 grain bullets all competitors fired in one of two classes; Open Bench, won by H. W. Barton, Wichita, Kans., and Open Varmint, won by Gerald Wilkinson, Cedar Falls, Iowa.

Perhaps worthy of note this year, not a single .30 caliber rifle was shot in any of the matches.

SEATTLE, WASHINGTON

Fifteen competed in the Puget Sound Benchrest Rifle Club matches on June 19 and 20. Shooting was in Benchrest Rifle-Un, Light and Heavy Varmint classes.

E. Frombach made a clean sweep of the Benchrest Rifle aggregates with .4310 at 100 yards, .5741 at 200 and .5011 grand aggregate. A. Bench was 2nd with .5608 and R. Speer 3rd with .5897.

E. Fromback won the Heavy Varmint grand aggregate with .5674. Roy Norman was 2nd with .5719 (1st at 100 with .4530) and C. Erb 3rd with .5845. L. Wilson was 1st at 200 yards with .6329 and Erb 2nd with .6352.

W. Davidson won the Light Varmint grand aggregate with .6570, A. Frombach 2nd with .7065 and E. Frombach 3rd with .7860.

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HUNTER RIFLE MATCH

Fifty-eight participated in the Hunter Rifle Matches at the Richmond Rod & Gun Club, California, on June 13th. Val Neuman was the match winner with score of 236 X 250, followed by Denis O'Leary 234, Dan Plummer 232, Chas. Stiltner 229 and Chuck Babcock 228. New names keep getting into the winning places in these matches and past winners take some whopping slumps. Thirteen of the shooters fired with iron sights.

VARMINT MATCH: The night of June 26 a 100 yard NBRSA Varmint class match was fired which Ed Suchan won with a .2497 aggregate. Tom Squires was 2nd with .3418, George Fullmer 3rd .3813 and Allen Hobbs 4th .3852.

BUFFALO, WYOMING

The Buffalo Outdoor Rifle Club midsummer registered matches were fired July 10 and 11, the 100 yard matches being fired Saturday and the 200 Sunday. The Heavy Varmint class matches were fired in the afternoon each day and the Benchrest Rifle-Re class at night.

In Heavy Varmint class, Pat and Mac McMillan apparently had a family squabble for top honors, Pat taking the aggregate with .3738 over Mac's .3963. At 100 yards it was Mac .3254, Pat .4135 but at 200 Pat had .3542 to Mac's .3673. Third at 100 wasa C. C. Hankins .4164 and at 200 Frank Minucci .5460 but in the grand agg. it was Bruce Pheasant with .4921.

With Benchrest Rifle-Re at 100 yards it was Manley Oakley .3070, L. E. Wilson .3375, I. F. Williams .3387; at 200 Roy Norman .4330, L. E. Wilson .5279 and

(Continued on Page Fourteen)

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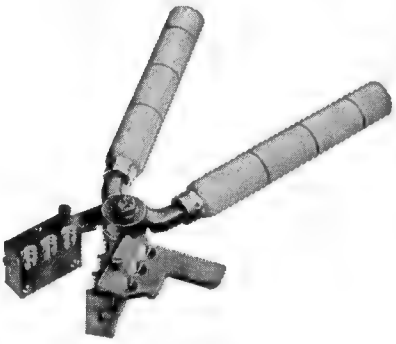

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Bench Rest Match Reports

(Continued from Page Thirteen)

Jack Thompson .5325. Roy Norman won the grand with .4118 over L. E. Wilson's .4168. I. F. Williams was 3rd with .4557.

TULSA, OKLAHOMA

At the Tulsa Bench Rest Rifle Club's July 17th match 24 shot in Varmint class and 9 in BRR-Un class. Temperature is reported very hot but conditions otherwise very excellent.

In Varmint class, R. L. Shanafelt, a second season compeittor, was 4th at 100 yards with .3096 but was 1st at 200 with .2792 to win the grand with .2944. Following him were John R. Bushnell .2794 (2nd 100), .3689 (3rd 200), for 2nd in grand with .3241; Larry Engelbrecht .3052 (3rd), .3537 (2nd), .3294; Gary Hanson .2680 (1st), .3726 (4th), .3402. Larry Beard, shooting a Light Varmint rifle against the 13½ lb. guns, was 5th at 100 (.3200), 8th at 200 (.4412), 5th overall with .3806 and his .095 inch group was the smallest fired at 100 yards.

With Bench Rest Rifle-Un., Walt Berger was the winner of all aggregates with a grand aggregate of .3047. Jimmy Cook had .3205 and Bob Stultz .3409. The biggest of seven aggregates completed was .4818.

ABILENE, TEXAS

The Texas State Light Varmint and Sporter Class Championship matches, conducted by the West Texas Sportsman Club on July 17-18, had 26 competitors in Light Varmint and 15 in Sporter class. Conditions are reported to have been about par for the time of year in that area—wind and mirage.

The high aggregates were: Sporter class; 100 yards, Tom Gillman .606, Dr. Sam Nadler .612, Henry Moore .613. At 200 yards, H. W. Ward .743, Gillman .786, Nadler .845. Grand aggregate; Gillman .696, Nadler .728, Ward .790, Moore .811.

Light Varmint class—100 yards; Tom Gillman .354, J. H. Carpenter .515, E. L. Thomason .535. At 200 yards; John D. Richardson .665, Gillman .738, H. B. Reagan .786. Grand aggregate; Gillman .546, Richardson .603, Carpenter .677, Reagan .706.

FASSETT, PENNSYLVANIA

The Pennsylvania State Varmint Championships were held at the South Creek Rod and Gun Club, Fassett, Pa. on July 24-25 with 40 shooters competing in the Heavy Varmint, 19 in Sporter and 12 in the Light Varmint classes. Trophies were awarded for the first three places in each class.

The new facilities were used for the first time at this shoot and, we trust, enjoyed by all. The weather was lovely but conditions were especially tricky. The trophy winners were:

	100 yd.	200 yd.	Grand
HEAVY VARMINT			
Wally Hart	.3358	.6577	.4967
Robert Hart	.4340	.6178	.5259
Frank Terrill	.4702	.6312	.5507
SPORTER			
L. S. Rucker	.4576	.6522	.5549
Paul Gottschall	.5548	.5900	.5724
Dave Hall	.4702	.6312	.5943
LIGHT VARMINT			
Robert Hart	.4256	.6392	.5324
L. S. Rucker	.4000	.7572	.5787
Omar Rinehart	.5246	.6601	.5923

Reported by Paul R. Kempfer

CALIFORNIA STATE CHAMPIONSHIPS

The California State Benchrest Championship matches were fired at the Richmond Rod and Gun Club range on July 24 and 25. Competition was in four classes and the high ranking aggregates were:

Benchrest Rifle-Un.; 100 yards, Felix Marincovich .378, Ed Suchan .385, Wally Titus .437. At 200 yards, Marincovich .3277, Suchan .4204, Allen Hobbs .4696. Grand Agg. Marincovich .3528, Suchan .4027, Hobbs .4545.

Benchrest Rifle-Re; Don McLennon .454, Earl Jacobson .498, Joe McPhillips .503. At 200 yards; Jacobson .4602, McLennan .5905, Ray Speer .5859, and grand agg.; Jacobson .4791, McLennan .5222, Speer .5729.

Heavy Varmint class—100 yards; Allen Hobbs .3950, Geo. Fulmer .3960, Ed Suchan .4070—200 yards; Fumer .3796, Hobbs .4061, Suchan .4453—grand agg., Fullmer .3878, Hobbs .4005, Suchan .4261.

Light Varmint class—100 yards; Jacobson .3960, Suchan .4180, Ken Jones .5000—200 yards; Suchan .4758, Jones .6402, Jacobson .6762—Grand agg.; Suchan .4419, Jacobson .5361, Jones .5701.

Ex-state champ Chester Pluth did not compete. He had sold his gun and outfit to Felix Marincovich but came to the match to watch Marincovich win the unrestricted championship. Fullmer and Jacobson are also new state champs.

CANTON, OHIO

At the Canton-McKinley Rifle Club, July 30-31, 19 shot the 200 yard course with Varmint rifles. LaChat, Mangon, Spencer, Kilroy, Modock and M. Thomas all shot possible 200 scores, LaChat winning with 16x. Of the 19 shooters, 8 shot Rem. 40X rifles and 2 others shot 40X actions with Douglas barrels.

On August 7th a two-range Varmint class course was fired with 19 shooting the two-range aggregate and 10 more shooting only the 200 yard stage. At 100 yards George McMullen beat Paul Gottschal .3824 to .3842. Mervis had .4214, Bernice McMullen .4338 and Omar Rinehart .4488. Gottschall won the 200 yard stage with .3842, Al Creighton had .4158, Young .4230 and Rinehart .4589. Gottschall's winning grand aggregate was .3825, Rinehart had .4535 and Young .4672.

This was Gottschall's day. The 200 yard stage was also listed for score and he won that with a 250-22x, his smaller group average outranking Young's 250-22x score. Gallimore was 3rd with 250-15x.

Frank Tetrault, winner of Roseland, N. J. smallbore rifle position tournament (reported in July issue).

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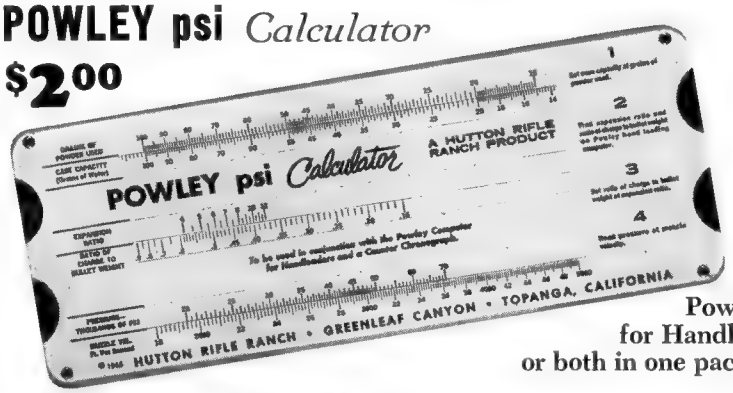

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THE BEGINNER CARVES A STOCK

Of course a beginner can make his own gunstock! All it takes is confidence and a block of wood. It helps to be a little bit crazy, but maybe all benchresters are at heart or they wouldn't try to put all their bullets in one hole!

There are definite steps to be taken in stock making. First you find a picture of a $5000 custom gun that has a stock you like. The fact that it is a heavy free-rifle design should not deter you—just order light wood. After waiting for a blank of butternut—extra thick, please!, it comes—all ten pounds of log, unwrapped, with your name and address and the stamps fixed directly to it. It IS a bit crooked and there's really no flat surface to begin with—but those are minor details.

Then comes the day Ross Sherman tells you he'll have your barreled action in a week, and the next shoot is three weeks away. That's oodles of time! That means the first week of evenings you can rough out the blank, the second week inlet the barreled action and have ready to shoot, and the third week load shells! No sweat!

As you look at the penciled outline, the more you dream and think of the final result. Better put some work under that dream though. The first weekend comes round and it's time to get the barreled action. Where did the time suddenly go? It works out though—you take the hunk of wood along and cut it out on your brother-in-law's bandsaw. Now you're back on schedule. There are six evenings to work it into a shaped, inletted and workable firearm!

You rent a router and rough out the inletting and do some fancy shaping. Bob Stinehour had said to work from the front guard screw, so you do and bit by bit, with rouge, chisels, carving tools, rasps and sandpaper—to the tune of a few offbeat words—the barreled action and trigger go in.

Then you stand back and admire it. It's rough but with pleasing lines—and it's ready to take out and shoot the next day. You can smooth it down and apply a finish during the winter. Hey, this is fun! It really wasn't too hard, either! It does seem a bit heavy though. Maybe you'd better put it on the scale. Fifteen pounds ! ! ! ! ! ! Anybody got an aspirin?

After you recover from shock you take it out and shoot it—and it earns the nickname of "Monster" from the gun club—but the darn things shoots! ! ! !.

The next week becomes a nightmare. First one part and then another goes under the heavy rasp as you fight for weight. The design you dreamed about fades away. You put it on the scales and they mock you. There's nothing left but to hollow it out with brace and bit. By this time it's a determined war—you against a piece of wood—and when the bit comes out the side of the cheekpiece and then the pistol grip—you wonder if you haven't lost. With a what the heck attitude, you fill in the holes with darker wood dough and decide to make them into interesting knot holes when you apply the finish.

Your sense of humor restored, you battle the last few ounces—coming out with a more or less heavy benchrest design—now hollowed to make the 13½ lb. class. It's a far cry from what you planned, but then—variety is the spice of life! It weighs 13½ on the button—if you don't sneeze—and you head for Council Cup.

When you get there, you proudly show your gun to Ross Sherman. What's that funny look on his face? That's strange—when you show Bob Hart, he too gets that peculiar expression. It comes time to weigh in. You're not worried—you can always take off the trigger guard if it checks in a couple ounces over! Right on the nose! Now Ross and Bob are smiling—but I wonder if Ross is still shaking his head?

You don't do too bad in the aggregate—and look forward to the Nationals at Johnstown. Reckon though, a little should come off the pistol grip—the next scale might not stop in such a convenient spot!

Come to think of it—maybe if I make the next stock of styrofoam I can still use that design—and maybe make sporter class with my 243. I wonder?

Jean Streeter

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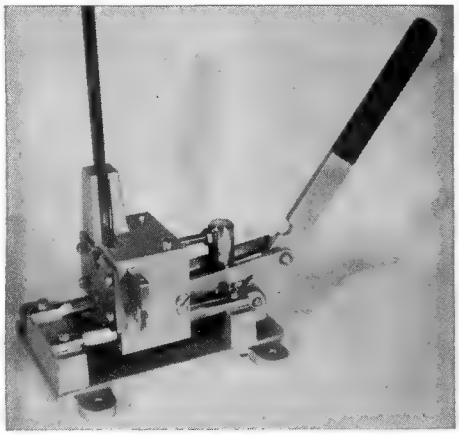

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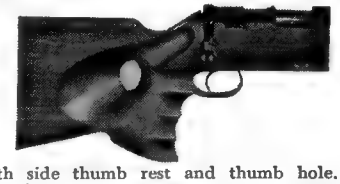

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Winners in the Regional and Idaho State Smallbore Rifle Championships at Twin Falls, Idaho, July 3-4-5, 1965. Left to right are Michael Allen, Jo Ann Sanborn, Raymond L. Wheeler, NRA President Harlon B. Carter and Dorothy Sanborn.

Random Shots

(Continued from Page Five)

give you an insight into Hank Benson's personality, he declined to be considered for the trip to the Nationals, announcing in advance, "I'm going there anyway, so why should I take the trip from a deserving shooter?"

Firing his Atkinson-Marquart 52C, with Kenyon trigger, in a Grater stock, Kenyon rear sight, Bell front, Lyman 20X scope, with Mark III, Bill Grater cleaned the **Dewar** metallic with 400-36X; Robert Ott, Hill AFB, 400-32X . . . At **100-yds.** iron, Bill had 400-32X, and JoAnn Sanborn Creedmoored Ray Wheeler and Karl Kenyon with 399-23X . . . Mike Allen won the **50-yd.** any—400-33X to Grater's 399-31-X. . . . Grater snapped back at **50-meters** any and edged Allen, 400-34X to 400-33X.

Rounding out the State Championship Aggregate were Karl Kenyon—1596-109X, and Mike Allen—1595-131X. Wheeler also ended up with a 1595.

Larry Hovey of the **Twin Falls Times-News** was provided with a wealth of newsworthy material for his Magic Valley sportsmen readers. He deserves special recognition for his outstanding series of articles. His most recent story, based on his own reaction to a TV news program featuring excerpts from one of Sen. Dodd's sub-committee hearings—and supplemented with interesting facts obtained from the NRA President—stands out above any which we have seen in any newspaper. Thanks, Larry!

****

Capt. Pres Kendall, USA, claimed his third regional of the summer at the **Knoxille, Tenn.** Smallbore Prone Regional on July 3-4. Firing the 40X which was his National Position Championship award last year, with that very special R-50 ammo, Pres piled up quite a noteworthy X-count. With a 3197, he had 260X's! It was Kendall's brand of wind—shades of the '62 Nationals when he won the prone crown.

Int'l Prone Team members were in the forefront as **Ed Summers** was runner-up to Kendall with 3196-255X and **Douglas Knoop** placed third with 3195-251X.

An exciting rivalry developed for both the Collegiate and Ladies' titles. **John M. Garrison,** a junior shooter from the University of West Virginia, out-X'd **Eric Sundstrom** of the Citadel, 3194-240X to 3194-233X for 4th place and the regional Collegiate championship . . . Former National Woman's Champion **Janet Friddell** had a 12X lead over North Carolina State Open Champion **Mary** Parris, as her 3184-223X was good for the regional Ladies' silver and Mary won the High Junior award with 3184-211X.

Kendall cemented his victory by taking the opener at 50-yds. iron—400-38X; 100-yds.—400-32X; the Dewar—400-31X; and the **Metallic Aggregate**—1599-129X. . . Doug Knoop won the 50-meter iron with a possible and 32 . . . Other iron sight leaders were: (2) Sundstrom—1597-112X; (3) Summers—1596-119X; (4) Knoop—1596-110X.

Garrison and Sundstrom teamed up for a winning 798-56X over Mary Parris and R. D. LeGrand's 798-50X in the Dewar metallic.

With the glass, **Ed Summers** steered all his shots where they belonged and produced a very fine 1600-136X. He was hard-pressed by Larry Moore, who dropped a point at 50-yds. but cleaned the rest for a

1599-145X; Doug Knoop's 1599-141X, and Dr. Robert B. Kennerly's 1599-131X . . . Doc Kennerly took the 50-yd. with a 400-39X . . . Jan Friddell's 400-37X Creedmoored those of Sundstrom, Summers, and Kennerly at 50-meters . . . Glad to note that John R. Tucker, Sr., had a 400-30X. Me is the gracious gentleman from Roanoke, Va., who took the time and effort to translate this regional bulletin for me in his beautiful penmanship which is a pleasure to read.

Since the subject has been introduced, any tournament sponsor who lists competitors by number in lieu of names and who records scores by the number of points dropped is depriving the winners of the recognition they deserve. Let me stress that I am not sniping at a single club. The Volunteer Rifle & Pistol Club has been conducting outstanding tournamenst for years and I have always enjoyed competing in Knoxville. A number of clubs, however, have adopted the abbreviated form on their bulletins, apparently to save paper. They are unaware that they are doing the shooter a disservice. Winners of shooting events receive entirely too little credit for their achievements as it is. Please, let's at least spell out their names on tournament bulletins! Take a tip from Ken Stannard. He plans to include highlights and pertinent information on the Roseland, N. J. Fall Prone Tournament in the results bulletin. Ken and his friend, Art Burton, are two shooters who are actively interested in keeping our sport alive and exert a great deal of effort toward that end. We need more like them.

Let's return to Knoxville and the 100-yd. any sight match. A 400-37X won it for Larry Moore. He was reportedly shooting Eley ammo . . . Reminds me of a certain Knoxville regional when no ammo could have helped us at 100-yds. any. Much to the chagrin of some well-known shooters, they dropped as many as 10, 15, and 20 points in that one match. Quite a contrast in conditions when only 3 Xs were dropped here . . . The final match, the Dewar, also went for 400-37X by Doug Knoop, who led in the International Shooting Fund Match, aggregate of the 50-yd. and 50-meter metallic, with 800-67X.

Rounding out a few of the better Grand Agg. scores, we have Larry Moore in 6th place—3190-256X; Everett Smith of Knoxville—3188-222X; Dr. Kennerly—3186-228X; High Expert—John J. Owen, Jr., of Savannah, Ga.—3185-209X; and Michael Kennerly—3184-219X.

The finis was an excellent Dewar any 800-68X fired by Ohioans Summers and Knoop, as Garrison and Sundstrom were second team with 800-51X.

***

Practicing up for Vietnam, Capt. **Kendall** added the **Kentucky State High Power** title to his string of summer victories. Firing a strange rifle for the first time, he averaged 248! His father, Walter Kendall, was also a competitor . . . Boy voyage, Pres!

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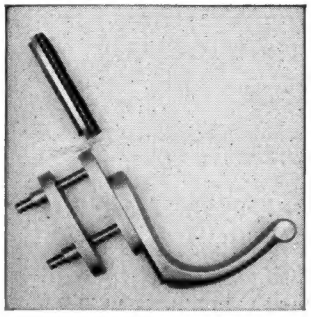

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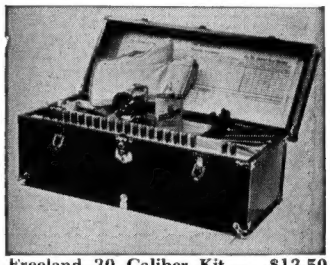

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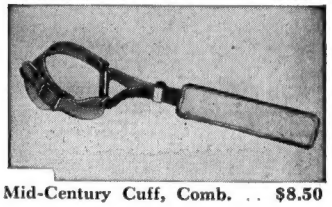

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For another 4th of July week-end regional, let's switch out west to **Denver**, where another 1963 Prone Team member—**Herb Hollister**, took home the **Smallbore Prone Regional** silver. (This **does** speak well for the tryout system, does it not?)

Conditions with **irons** were challenging with a tricky, fishtailing wind. **Hollister's** 1591-101X was high. Ed Caygle was Hi Service — 1589-105X; Civilians: Clyde Reedy—1588-94X; Kris Sundstrom Nelson—1587-104X; Bob Findley—1586-100X . . . Individual winners: **50-yd.**—D. Reed, 400-31X; **50-meters**—Findley—398-28X; **Dewar**—Kris Nelson, 399-29X; **100-yd.**—Reedy—399-16X; . . . Bob Findley and Joe Farmer won the metallic Dewar team match—797-58X.

George Stidworthy can frequently be depended upon for a 1600 with scope. His 1600-136X led Hollister's 1599-135X, Far-

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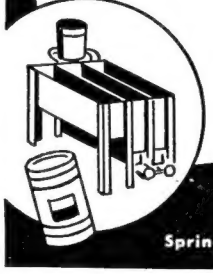

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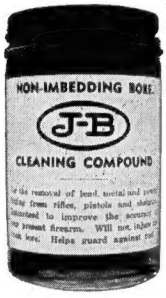

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mer's 1599-129X, and Caygle's 1598-131X. . . . **Any Sight** match winners: **50-yd.**—Caygle, 400-38X; **50-meters**—Hollister, 400-36X; **Dewar**—Stidworthy, 400-37X; **100-yd.**—Hollister, 400-31X.

The **Texas State Smallbore** (Prone) at Houston was a tough one. Headliners were **Ed Caygle** who nosed out **Dick Hanson** 3194-255X to 3194-231X . . . The Air Force was there en masse. With the All-Air Force matches on tap the following day, most major command teams were present. . .

Still, attention was focused on civilians because **Texas sends a state civilian team to Perry**, composed of the 5 high civilians in the Grand Agg. and a junior. Other state associations, please note . . . Texas has grown some rough and ready shooters in the past, which makes it newsworthy that three members of the team are young ladies, two of whom are juniors . . . Led by Dick Hanson, the team is composed of the following: Gabby Kuhn, Orange, Tex.—3183; Huffman, Arlington, Tex.—3181-215X; Bob Findley, El Paso—3181-205X; (Jr.) Donna Hanson (Dick's daughter)—3177; Mary Wall (Junior team member), Orange, Tex.—3167. Raymond Sargent, who fired 3185, declined a team spot because NRA duties prevent his firing with the team.

USAF #2 team outshot the #1 team in the team matches and established a National Service Record with a 1599 in the 4-man Dewar metallic.

****

What a shame that the **Ed McDaniel Memorial Tournament** at Cimmaron, N. M. was flooded out on June 19-20. Bob Findley reports that he tried to attend, but arrived there to find such inclement weather that he left as soon as possible. He and Marge were lucky to get out as the only road left, through Eagles Nest and Taos, was partly under water.

• • •

RIFLE BARREL TWIST RATES

(Cont. from July—pg. 19)

The third comment was from Herbert Troester (North Dakota). He took issue with some of the points I had mentioned as possibilities (which I had hoped for) but I believe his disagreements were largely due to a misunderstanding of what I had tried to say.

He quoted some comparative tabulations of velocities and pressures between the Remington .244 and the later Remington 6mm, all with a 75 grain bullet but with permissible charges for each caliber with several different powders, ranging from 4759 to 4350. The 6mm figures were obtained with a 9" twist 20¼" barrel and the .244 with a 12" twist 26" long barrel. Considering the difference between the barrels, with cartridge case powder capacity and bullet weight equal for both, the differences in the tabulated comparisons were generally quite logical. For five of the seven comparisons a heavier charge of the powder was used in the slower twist longer barrel of the .244 and in all these five cases the velocity was significantly higher for .244, and the **pressures very considerably lower,** than for the faster twist shorter barreled 6mm. For 4895 and 4759 powders, the charges were the same for each gun. For 41.5 grs. 4895 in both guns, MV was 3535 and PSI 51,200 in the .244 and MV 3310 and PSI 51,700 in the 6mm. For 26.5 grs. 4759 the MV was 2895 and PSI 50,600 in the .244 and MV 2760 and PSI 49,100 in the 6mm—this being the only case of the pressure being lower in the 6mm.

It is recognized that the steeper the twist in a rifle barrel the greater is the resistance to the passage of the bullet through the barrel, especially at the start of its travel, and, all oher things being equal, this resistance increases the pressures, especially the "peak pressure." Therefore, the higher pressures, even with lighter charges, could be expected in the steep twist 6mm.

In general, and except possibly for the very fast powders with light weight bullets and resulting very fast barrel time, within the reasonable limits of shoulder firearms, muzzle velocities tend to be greater from long barrels than from short barrels. So, even with equal powder charges, muzzle velocity from the 26 inch .244 barrel should expectably be higher than from the 20¼ inch 6mm barrel. Also the lesser bullet resistance in the 12" twist barrel should add at least a little to the muzzle velocity.

Now for the points of disagreement, which I believe to be more a matter of confusion over terms than anything else.

Mr. Troester writes: "Your paragraph on RPM rate I cannot agree with. If the RPM rate remains fairly constant, then as forward velocity of the bullet decreases, the bullet will make more than one turn for each foot of forward travel. The bullet will actually make one turn (revolution) per foot of (forward) travel only while in the bore, because it begins to lose velocity the instant it clears the muzzle."

What I stated in the May issue (page 8) was: "We have been told that the **REVOLUTION RATE** of a bullet did not decrease appreciably in its flight from rifle muzzle to target, even at long ranges." In my following sentence; "That is, if fired from a barrel having a twist of 1 turn in 12 inches, the bullet will continue to make one revolution for each foot of forward travel." I may have been wrong and Mr. Troester nearer right than I was.

The bullet ROTATIONAL RATE would be relative to the twist in that it would represent the lineal distance a bullet would travel while making one complete revolution. RPM RATE of course represents the number of revolutions a bullet would make in one minute. Regardless of the bullet ROTATIONAL RATE, I believe that the RPM RATE would be proportionally increased as the forward velocity might be increased—because the shorter time of flight over a given range would permit an approximately equal number of bullet revolutions in a shorter period of time.

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Jim Rudolph's contention that "rotational SPEED of a bullet **must** drop some, — "may well be right to some degree but I'd guess that air friction would affect forward (linear) velocity of the bullet to a much greater degree than it would the rotational BEHAVIOR. And just what does ROTATIONAL SPEED mean? If it means the speed of the circumference of the rotating bullet, that brings a matter of bullet diameter into consideraiton. And that adds bullet diameter to the three values (length, weight, velocity) that Les Bowman mentions effecting the desirable twist rate.

As the diameter of a bullet increases its length in relation to weight decreases—and the optimum twist rate increases. For example, some 190 grain .30 caliber bullets I make are 1.245" long, while a .375 caliber solid point bullet I have weighs 300 grains and is 1.235" long. In Eichhorn's tables the optimum twist listed for the .30 cal. 200 gr. bullet at 2700 FPS velocity is 1 turn in 10.6 inch. For the .375 cal. 300 grain bullet at 2700 FPS it is 1 turn in 15.1 inch.

Another point that I think should be considered for bullet stability in flight is the increase in circumference speed and momentum as the bullet diameter (caliber) is increased. Since the circumference of the bullet does increase proportionally with the increase of diameter, at the same RPM rate the circumference speed increases in like proportion. Further, with a greater proportion of weight distributed further from the bullet axis (center of form) the momentum properties would be greater and the "free-wheeling" circumference speed of the larger bullet would be better maintained than for the smaller diameter bullet.

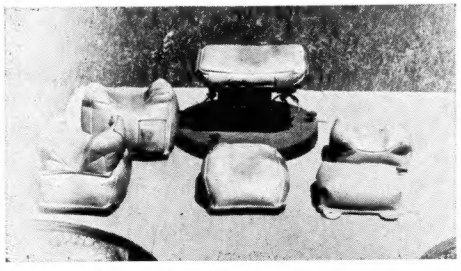
Reports of tests for extreme long range shooting indicate that the bullets arrive point-on at the targets at the extreme ranges (see "Notes From The Library," page 4, May 1965). This would indicate that standard rates of twist adopted for the various calibers is generally adequate for its purpose, and that the bullet is still spinning fast enough at the end of its extreme range flight to provide adequate stability.

I would repeat that I think the adoption of twist rates fast enough to stabilize the longest, heaviest bullets generally available for use in any given caliber, for mass manufactured rifles, is sensible and desirable.

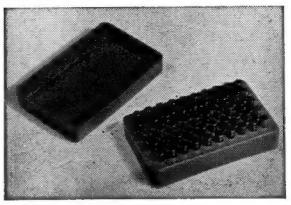
In my opinion, for the average shooter, too fast a twist is more desirable than too slow a twist. The rifleman who may insist on an optimum twist for some specific purpose can resort to a custom made barrel, and if that may be a very unusual twist it could be expensive. The average handloading rifleman with his mass produced factory rifle can have some small control over RPM rate by governing the velocity of his loads for specific purposes with specific components.

For the average rifleman the discussion of optimum twist rates may be more academic than practical, but is nevertheless of interest.

P. H. T.



The ProtektoR model sand bags for bench rest shooting which are made and sold by Basil Tuller, 29 Germania St., Galeton, Pa. 16922. In the center is the No. 1 set of bags. At the left is the No. 2 set of bags which were designed particularly for sporter-hunting rifle stocks. At the right are the "owl's ear" (top) and "sausage" bags for front rest pedestals with the smaller bag trays. Mr. Tuller also makes other leather accessories for the shooters.



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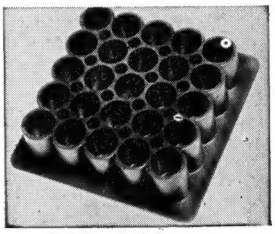

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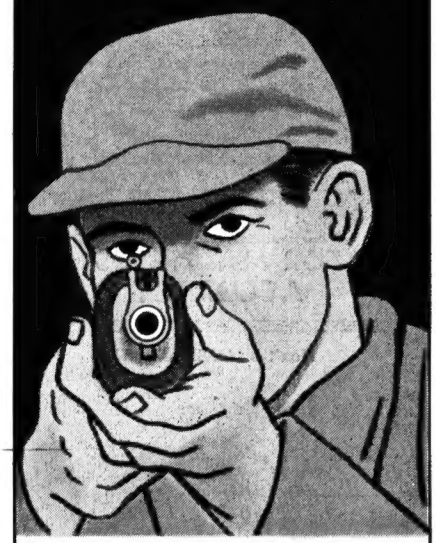

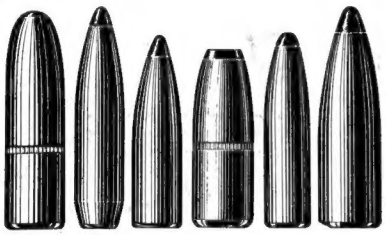

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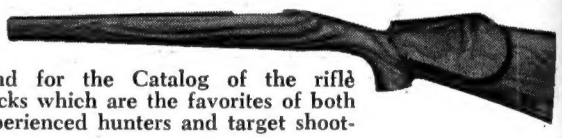

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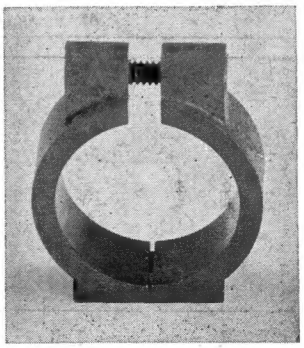

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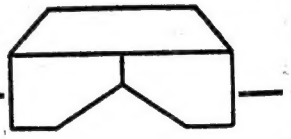
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